The success of the diversified farm – resource-based view

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ACADEMIC DISSERTATION
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Contents

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Farms and rural areas have many specific valuable resources that can be used to create non-agricultural products and services. Most of the research regarding on-farm diversification has hitherto concentrated on business start-up or farm survival strategies. Resource allocation and also financial success have not been the primary focus of investigations as yet. In this study these specific topics were investigated i.e. resource allocation and also the financial success of diversified farms from a farm management perspective. The key question addressed in this dissertation, is how tangible and intangible resources of the diversified farm affect the financial success.

This study's theoretical ackground deals with resource-based theory, and also certain themes of the theory of learning organisation and other decision-making theories. Two datasets were utilised in this study. First, data were collected by postal survey in 2001 (n = 663). Second, data were collected in a follow-up survey in 2006 (n = 439). Data were analysed using multivariate data analyses and path analyses.

The study results reveal that, diversified farms performed differently. Success and resources were linked. Professional and management skills affected other resources, and hence directly or indirectly influenced success *per se*. In the light of empirical analyses of this study, tangible and intangible resources owned by the diversified farm impacted on its financial success. The findings of this study underline the importance of skills and networks for entrepreneur(s). Practically speaking all respondents of this study used either agricultural resources for non-farm businesses or non-farm resources for agricultural enterprises. To share resources in this way was seen as a pragmatic opportunity recognised by farmers.

One of the downsides of diversification might be the phenomenon of over-diversification, which can be defined as the situation in which a farm diversifies beyond its optimal limit. The empirical findings of this study reveal that capital and labour resource constrains did have adverse effects on financial success. The evidence indicates that farms that were capital and labour resource constrained in 2001 were still less profitable than their 'no problems' counterparts five years later.

Key-words: resource-based theory, financial success, diversified farms

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1 Introduction

Rural areas are going through a rapid socio-economic change. The most important traditional rural industry, agriculture, is already under severe and growing pressures. Globalization, fierce competition in world markets, crises in food safety, turbulent situations in energy markets and poor profitability of many agricultural products have led to decreases in farm incomes and increased uncertainty. In addition, new demands for land use, bioenergy and environmental issues will certainly change the operational environment of agriculture. Simultaneously, globalization, rapid technological change and population trends have affected the other economic sectors in the rural setting, so there is urgent need for new enterprises and new income opportunities. At the same time there is an increasing demand for new rural services and products. Rural areas provide a unique range of business opportunities. Farm diversification provides one solution that meets such demands. Farmers are often well placed to take advantage of opportunities of increasing demand for rural products and services (Haines and Davies 1987, Rantamäki-Lahtinen et al. 2005). On the other hand, the changing environment of agriculture has drastically affected farm incomes, which has led many farmers to seek additional incomes from other enterprise activities.

Diversification is by no means a novel phenomenon for farmers. Agricultural historians report diversification activities dating from medieval times (Friedmann 1986, ref by Carter and Ram 2003). Many of today's top Finnish firms were started on farm premises (Hautamäki 2000) and it has been customary for Finnish farmers to earn income from multiple sources (Peltola 2000). The findings of Carter (1996) and Carter and Rosa (1998) suggest that farmers do adjust to changing conditions in similar ways to other small business owner-managers and one way to adjust to a changing economic environment in farming is to diversify.

The importance of diversification has increased rapidly over the last 10 to 15 years. The proportion of farms with another gainful activity[1] (OGA) rose from 6 in 2003 to 12 per cent in 2005 in the EU-27. In Finland, farm diversification plays an unusually important role in the rural economy. This is because the number of diversified farms as a proportion of the total number of farms in Finland is greater than anywhere else within the European Union (Eurostat 2007). Only in Norway is the share of diversified farms greater than in Finland. Moreover, alternative remunerative diversified activities are more common in Western and Northern Europe, in such countries as France, the UK and Germany, than in Eastern and Southern Europe (fig. 1.1). As far as the author is aware, there are no studies in respect of these geographical differences existing. However, one could assume that such differences are due to many reasons including: different national overall economic conditions, the varying structure of farm holdings and cultural aspects. For instance: if the share of very small agricultural holdings that are producing products for mainly for own consumption is fairly big, then diversification will not be an option. This is because many of these farms lack the needed resources. Nevertheless, diversification is common in Finland in addition to many other countries and is thus a relevant option for many farmers.

The number of diversified farms in Finland increased by approximately 6 per cent from 2000 to 2007. Over the same period the total number of farms decreased by 25 per cent (Tike 2008). In 2004 and 2005 there were a total of 131 500 small rural enterprises and farms in Finland, of which 34 per cent were engaged in basic agriculture alone, 18 per cent were diversified farms and 47 per cent were other small enterprises (Niemi and Ahlstedt 2007). A total of 24 300 Finnish farms were diver-

1 Other gainful activity is an activity that do not comprise any farm work but is directly related to the holding using its resources and has an economic impact on the holding' (Eurostat 2007). The term is narrower than farm diversification definition on this dissertation.

sified in 2005 (Table 1.1), thus every third farm was engaged in non-agricultural entrepreneurial activity. Diversified enterprises employed 22 300 man-years of personnel, and they operated along many different lines of businesses (Tike 2006c).

It can be predicted that the role of diversified farms will increase in the future. Agriculture is going through economically difficult times, thus policymakers and in addition to farmers have many expectations of success resulting from non-agricultural diversification. On the other hand, management of a diversified farm is a challenging task. Most of the research concerning on-farm diversification has concentrated on business start-up or farm survival strategy (Polovitz 2001, Rantamäki-Lahtinen 2004, Pascotto 2006). For instance, resource-allocation has not been in focus. Currently, little is known about how diversified firms develop and are managed. Moreover, there is a paucity of knowledge on how different resources can be successfully combined. This study focuses on the relationship between resources and the performance of a farm, and it draws on the relevant strategic management literature. Special attention has been given to the over-diversification phenomenon and also to learning. The theoretical background of the study is predicated on resource-based theory (RBT), and theories of learning organization and decision-making.

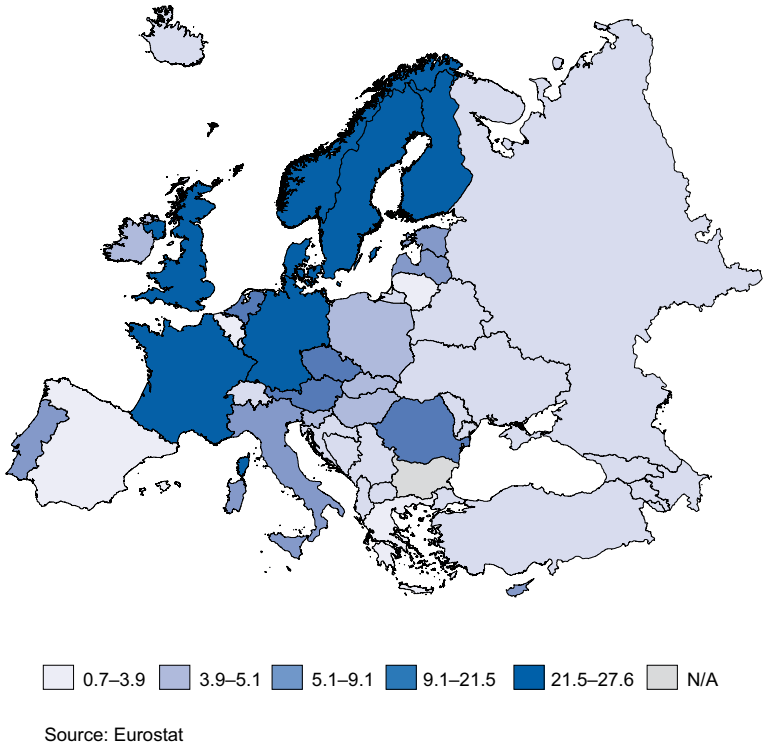

Fig. 1.1. Agricultural holdings with another gainful activity 2007 in European union. Source: Eurostat 2009.

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1.1 Core concepts

The terms such as 'entrepreneurship' and 'enterprise' can be defined in very different ways. In the narrowest sense, entrepreneurship is only the fleeting moment during which a new firm is born or an existing one is developed via innovations (Schumpeter 1947). Sometimes entrepreneurship refers to business start-ups, and the third group of definitions is the broadest, in which entrepreneurship simply refers to small firms (Malecki 1994). In this study the entrepreneurship is defined similar to the two latter definitions: it covers both new business start-ups and the development of existing firms.

Table 1.1 The numbers of Finnish diversified farms in different lines of industries 2000–2007.

Lines of business	2000	2003	2005	2007
All Finnish farms	79 800	73 700	69 500	68 244***
Diversified farms, total	21 838	23 551	24 295	23 179
Primary production (other than agriculture and forestry)	744	1 328	1 815	1 505
Aquaculture	112	102	64	120
Fur farming	632	647	510	505
Reindeer husbandry	*)	423	574	471
Fishing	*)	156	144	191
Other primary production	*)	*)	523	218
Industry	4 786	4 140	3 753	4774
Food processing	1 065	846	684	620
Other processing of agricultural goods	134	78	152	140
Wood processing	1 349	1 134	889	1 122
Handiwork items for retail	274	337	277	413
Renewable energy	648	701	820	1 286
Peat cutting	311	267	217	286
Metal industry	625	580	541	700
Other industry	380	197	173	207
Construction**)	*)	697	881	1 043
Trade	1 056	1 234	1 299	1 299
Services	15 019	16 143	16 547	14 470
Tourism, recreation	2 272	2 041	1 865	1 627
Contracting	8 880	9 039	10 013	8 539
Social and healthcare services	263	249	234	309
Transportation	1 055	1 083	833	782
Services to business	*)	736	680	661
Horse husbandry services (renting of stables, horse training)	*)	717	734	882
Real estate management, environmental care, cleaning services	*)	*)	264	190
Other services	2 549	2 278	1 924	1 480
Other	233	*)	*)	88

Source: MMM Tike *Different classification of sectors, this sector does not include data for the year concerned. **Clearing, demolition and groundwork building included in machine contracting. *** Horticulture is included 2007.

There are also numerous ways to define 'small business' or 'small and medium size business' (SME). The definition is often based on the turnover or on the number of the personnel employed. For instance, in the United States SME's are defined as companies that employ than 500 employees (Hussey and Eagan 2007). The European Commission recommendation for the definition is that: an SME is an enterprise that employs fewer than 250 persons and which have an annual turnover not exceeding 50 million €, and/or an annual balance sheet total not exceeding 43 million €. A small enterprise is defined as an enterprise that employs fewer than 50 persons and whose annual turnover and/or annual balance sheet total does not exceed 10 million €. A microenterprise is defined as an enterprise, which employs fewer than 10 persons and has an annual turnover and/or annual balance sheet total not exceeding 2 million € (The commission of European Communities 2003). On average a typical Finnish diversified farm's diversification enterprise employs 0.92 man-years and an average non-diversified farm employs 0.97 man-years of farm work (Tike 2006a). Hence, it assumed that diversified farms are primary microbusinesses. Rural entrepreneurship has been an important theme within small business research for the past couple of decades (Carter 1998) and in this study diversified farms are seen as a specific kind of rural enterprise.

The diversified farm

Penrose (1995) states that a firm diversifies its production when it brings to markets new products that are sufficiently different from existing goods and services, but still continues to produce conventional products. Diversification can also be defined as: where a firm's products have zero cross price-elasticity, i.e. its products or production lines have no market interaction with each other (Rumelt 1982). Another alternative is simply an increase in products or markets for a company (Lichtenthaler 2005).

The terms '*diversification'*, '*pluriactivity'* and *'agricultural diversification'* are often confused with each other both in academic and everyday discussions. Pluriactivity is a term that is related to income of a farm family; it simply means that a farm family gets income from multiple sources, and off-farm work is included in the total (Hawkins et al. 1993, Eikeland 1999). One can define that diversification as being a sort of sub-category of pluriactivity. In this study the focus is on management of the diversified farm, hence other forms of pluriactivity are left out. '*Agricultural diversification',* sometimes in agricultural economics referred as 'diversification', means a farm enterprise characterised by multi-product output, i.e. a set of different agricultural products are produced on the farm (Penrose 1995, Hardaker et al. 1998, Katchova 2005). For example, the multi-product case a variety of different cereals is the 'normal' situation on Finnish farms and will not be analysed further in this study.

What is non-agricultural activity and how to distinguish the 'conventional farm' from the 'diversified farm'? It is a tricky question, and classifications vary between different studies and countries. For instance, European Union legislation literature defines the agricultural holding as: '*a single unit, both technically and economically, which has a single management and which produces agricultural products'*. Moreover, those agricultural products are listed in the annex of the legislation (European Commission 1985). In contrast, NACE[2] and ISIC[3] classifications define agriculture simply as the production of crop and animal products (Eurostat 2002, United Nations 2002). Similarly, diversification can be quite broadly be defined as '*the entrepreneurial use of farm resources for non-agricultural purposes for commercial gain'* (Defra and National Statistics 2006). Thus, many activities such as growing unusual crops or producing unconventional animals are often defined as diversification activities. Quite often classifications are based on the 'line' of industry, such as those defined in Finnish Farm Structure Survey Statistics (Tike 2006c).

2 Classification of Economic Activities in the European Community

3 International Standard Industrial cades of all Economic Activities

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Diversification strategy can be defined differently. In the strategic management literature the direction of diversification has often been used as a tool of analyses. Robson et al. (1993) defines '*vertical integration'* as investing either backwards to the raw material stage or forwards to the consumer. '*Horizontal integration'* refers to the expansion of the new products or services, which are close to the primary line. A third type is, *'unrelated-diversification'*. There are several different ways of determining this. Two conventional ways to measure diversification are: 1) the business count approach and 2) the strategic approach (Sambharya 2000). The former means the use of industrial classifications, such as those used by ISIC or NACE. These make the assumption that, if businesses have the same code, they must also have common input requirements and similar production and technology functions (Markides and Williamson 1996). The latter requires a subjective categorization, and it is based on the degree of relatedness between business units that share skills, strengths and other common features (Sambharya 2000). Markides and Williamson (1996) state that relatedness of common inputs do not necessarily support superior performance. They claim that the measurement of diversification should be developed further by adopting features from resource-based thinking.

Carter (1998) divides farm-based activities into the following categories: farm-centred, additional business ownership and also external businesses located on the farm. In addition she classifies farmers into different groups comprising: mono-active producers, structural diversifiers and portfolio owners (Carter 1998). A UK based farm diversification activities benchmarking study divides forms of diversification into: 1) structural diversification, such as tourism and adding value to an enterprise, 2) agricultural diversification; such as unconventional products, forestry and agricultural contracting and 3) passive diversification meaning the leasing of land and/or buildings (University of Exeter and University of Plymouth 2003).

In this study, the term 'diversified' refers to the situation in which a farmer/farming family runs a farm and also a non-agricultural enterprise (Vihtonen and Haverinen 1995, Rantamäki-Lahtinen 2004). The term 'diversification', covers farming and non-agricultural diversification with the same enterprise and portfolio entrepreneurship (Fig. 1.2). The former has two or more business economic sector entries within one company (Robson et al.

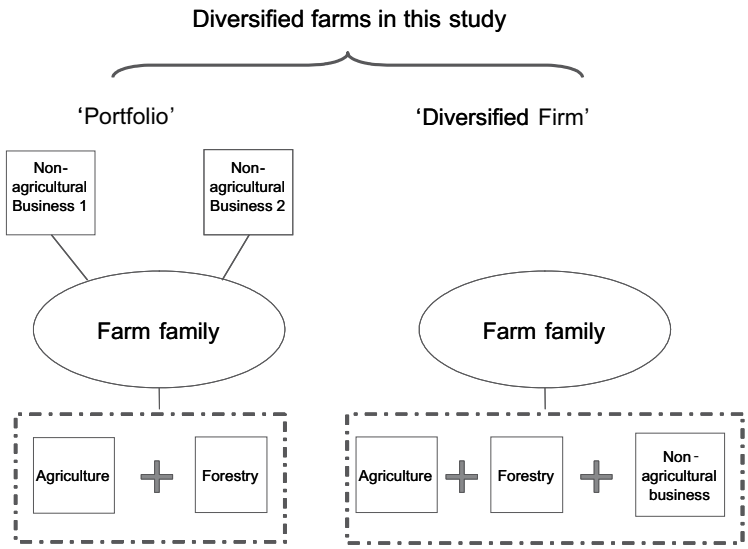

Fig. 1.2 In this study both different diversified farm types (portfolio type and diversified firm –type) are included under the definition of diversified farm.

1993). Portfolio entrepreneurs have been defined as people who have run at least two separate registered businesses at the same time (Carter 1998, Rosa and Scott 1999, Ucbasaran et al. 2003). Wiklund and Shepherd (2008) stress that it is important to study both new entries within old firms, and also new entries that are organised through the creation of new firms that are connected to a firm's portfolio.

The majority of the farm businesses could be classified as *farm family businesses* (Gasson et al. 1988, Gasson and Errington 1993). Reed et al. (2002) stress that the role of the family might actually be even more important in diversified farms. The concept of a single portfolio entrepreneur has been extended to cover the whole farm family because of the crucial importance of the family.

For practical reasons, the diversification activities in this study have been defined as those that have been compiled on Finnish Farm Structure Survey statistics (Tike 2006c). Passive diversification and external firms located on the farm are excluded. There is one notable exception: forestry is excluded from diversification activities. This contrasts with most studies from other countries, and there are two reasons for this. First, the growing-cycle of trees in the northern latitude setting of the Finnish climate is very long. It takes several decades to grow a tree to maturity for timber. Second, if forestry were taken into account, practically all the Finnish farms would be classified as diversified. This is because 94 per cent of Finnish farmers also own forest (Tike 2006b). In this study the relatedness of different lines of industries are determined empirically through joint resources.

Strategy

Strategy is a term derived from military language and nowadays is widely used in other settings including the academic world. It has numerous different definitions. In general the term strategy refers to long-term principles, which are used by firms in order to achieve set main objectives (Ansoff 1987). Strategy can be seen as a link between the firm and its environment (Heene 1997, Forsman 2004). Strategies can be categorized into different hierarchical levels ranging from the very fundamental to smaller and more easily changeable. *'Corporate strategy'* is a fundamental strategy that concerns the whole firm, and it determines big issues such as the size of the firm, direction of growth, diversification, mergers and specialisation The next level, '*competitive strategy'* is how a firm intends to compete and how it positions itself among its competitors. The most specific level is *'functional level strategy'*, which defines *inter alia* marketing strategy (Ansoff 1987). Forsman (2004) proposes that these different strategy levels can be found in and applied to small firms/farms though these are not necessarily consciously planned and implemented. Similarly, Torkko (2006) found that there are no official strategy processes in Finnish diversified farms. In this study, diversification is considered to be intentionally chosen 'corporate level'- strategy as used in other comparable studies (Rantamäki-Lahtinen 2004).

Resource

The term '*resource'* can be understood at very different levels and in many ways. Different definitions are discussed further and in detail in chapter 2. Briefly, resources are understood quite broadly, in this study, as tangible or intangible assets (Barney and Arikan 2005, Ray et al. 2003) that are tied semi-permanently to the firm (Wernerfelt 1984).

Success

Terms such as 'success' or 'performance' can be understood and measured in various ways and from different perspectives. According to Grant (1991), Peteraf (1993) and Perry et al. (2005) one of the objectives of RBT is to link the use of resources to firm's[4] success. In turn, success can be understood as economic profit or performance. Thus, in this study the success has been understood as: *financial or economic success*. Financial indicators such as turnover, profitability or return on investment are often used to measure economic success (Reichel and Haber 2005). Business growth is an important dimension of success (Wiklund 1998) and is often

4 A firm here means as firms in general, and diversified farms are included into term.

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measured by using financial indicators such as sales growth. In addition, some non-financial attributes, such as the number of employees have commonly been used for measuring size and growth (Smallbone et al. 1999). However, growth dimension has not been explored in this study, instead the focus has been on profit or similar 'relative' or superior economic success indicators derived from RBT.

There are also alternative ways of understanding firm's success such as: defining success as survival (Littunen et al. 1998, Wiklund 1998, Wade and Gravill 2002, Pasanen 2003, Reichel and Haber 2005). Similarly, success can be understood as to what extent goals set by the actors themselves have been achieved ('*perceived or subjective success'*) by arguing that many rural entrepreneurs are life-style entrepreneurs. They emphasize variables such as the quality of life, customer orientation, good leadership skills, internal marketing and a good reputation in addition to a firm's being passed onto the next generation. These can be more highly regarded by the entrepreneur than financial success (Potter and Lobley 1992, Gasson and Errington 1993, Cuykendal et al. 2002, Duffy and Nanhou 2002, Komppula 2002, Komppula 2004). These other success dimensions are important, but they have a different theoretical background than this study. They are more relevant in the studies where success has been measured from the point view of the small business owner (Carland et al. 1984).

When success of a firm is explored, it is essential to understand the multidimensional nature of the performance constructs. For example; a firm might be successful in one performance dimension and unsuccessful in another, and thus a multidimensional set of measures instead of just one measure should be applied (Lumpkin and Dess 1996, Forsman 2004, Madsen 2007). In this dissertation the terms success and performance are understood by interchangeable definitions and it will be measured using several variables but which all explicitly measure economic success. The operational definition of the concept and empirical content are discussed in the data and methods and results chapters.

There are two additional aspects of a diversified farm success that have to taken into account in this study. First, portfolio entrepreneurship brings an additional aspect of the definition of success. In order to measure the true performance of the portfolio, the unit of analysis should be all organisations owned by the entrepreneur, not just a single unit taken out of the portfolio (Westhead and Wright 1998, Rosa and Scott 1999). Thus, the success is viewed from the point-of-view of the whole business activity of the diversified farm (the farm and non-farm business jointly). In addition, many diversified farms are family businesses. Sharma et al. (1997) state that basic strategic management processes for both family and non-family firms are similar in the sense, that strategy has to be formulated, implemented and controlled in a context of a set goal. The differences are to be found between those set goals and the participants in the process.

1.2 Previous research

Over the years researchers representing numerous disciplines have studied farm diversification and portfolio entrepreneurship. These disciplines have been studied from the point-of-view of agricultural economics, small business research, sociology, rural policy studies, development studies and social anthropology. Some studies have focused of a single farm diversification industry, such as agritourism (Hjalager 1996, Busby and Rendle 2000, Nickerson et al. 2001) or on-farm processing (Ekman and Andersson 1998). In addition, diversification could be classified as one of the key issues in strategic management literature covering big enterprises (Penrose 1995, Markides 1997, Sambharya 2000, Park 2002, Carter and Ram 2003, Singh et al. 2004).

Socio-economic research in the farming sector has been dominated by agricultural economics and rural sociology (Ronning and Kolvereid 2006). Many social scientists and agricultural economists have seen diversification as a survival strategy for farm-based families. It has been studied as an important part of pluriactivity (Hawkins et al. 1993, Peltola 2000) and often conceptualised as 'part-

time farming', 'other gainful activities' or 'multiple job holding farm households' (Carter and Ram 2003). In agricultural economics, pluriactivity has been studied, in particular, from the point-of-view of a farmer's exit decisions and farm family's use of labour. Weiss (1997) studied the full/part-time farming decisions taken by Austrian farm households in the context of the off-farm labour market by using probit analysis and several cross-sectional samples. Their results showed that the full/part time decisions are not completely reversible, and that there was no significant relationship between the wages and a farmer's decision to go back to full-time farming. Kimhi (2000) studied the role of off-farm jobs and exit decisions by using panel data obtained from an Israeli. According to that study's results, farmers combine off-farm work and farming, instead of completely moving away from agriculture. Additionally, as reported in a study by Ahituv and Kimhi (2006), Israeli farms are now moving towards a bi-modal distribution; i.e. at one end large farms operated by full-time farmers and at the other end the smaller farms. In the latter case owners get most of their income from off-farm activities. Pluriactivity's affect a farm's ability to compete and the investments have also been investigated in an agricultural economics context. For example, Andersson et al. (2003) studied the effects of income from other sources in relation to investments and returns in agriculture by using a dynamic portfolio choice with labour income. Their results show that even though part-time farmers might earn lower returns than full-time farmers, they are compensated by lower risks.

In rural sociology and related fields of social sciences pluriactivity is often seen as an alternative livelihood strategy for rural households (Ilbery 1991, Eikeland 1999, Moxnes Jervell 1999, Kinsella et al. 2000, Peltola 2000). The phenomenon is not strictly restricted to farm households *per se* and has been identified in rural fishing households (Salmi 2005) in addition to other SME-owners across other industries (Carter et al. 2004). Earlier the pluriactivity, or part-time farming, was seen as an indicator of insufficient farm income or as an actual threat to efficient agricultural production. The 'ideal farm' exemplified by agricultural policy, was a family farm that was able to generate enough income for the whole family (Moxnes Jervell 1999, Peltola 2000). More recently, pluriactivity has been seen as a relatively stable adjustment (Moxnes Jervell 1999, Kinsella et al. 2000), and in fact it has been proven to provide higher incomes for farm families (Ronning and Kolvereid 2006). Many national and EU-level rural and agricultural policies have actually turned about and are now in favour of pluriactivity, and especially in diversification. It is seen that diversified farms increase the income opportunities in rural areas (North and Smallbone 2006, Ministry of Agriculture and Forestry 2007). Moreover, diversification can be an essential part for a sustainable and thriving rural economy (Turner et al. 2006). There has been an assumption that increased farm diversification would have a positive environmental impact, although this link has not been proved (McNally 2002). Despite these positive point-of-views, diversification is sometimes not taken into account in policies. For instance, farm diversification in Finland is not considered at national level rural or at an agricultural policy-level, though it has been recognised and actively promoted by local authorities (Vihinen et al. 2007).

During recent decades, there has been a growing interest in multiple business ownership and habitual entrepreneurship among small business research literature. Westhead and Wright (1998) elaborated on the subject by creating a typology of habitual entrepreneurs. They classified entrepreneurs as: 'portfolio founders' who own several businesses simultaneously, 'serial founders' who had sold their original business and started a new firm, and 'novice founders' who started and still own only one business. Rosa and Scott (1999) studied the rates of multiple-ownership and the role of portfolio entrepreneurs in the establishment of new firms in Scotland. In addition, they investigated whether the performance of the firm was associated with business clusters belonging to the same owner. Data triangulation was used; and they analysed three quantitative data-sets. The key findings highlighted, that new Scottish companies are significantly linked to existing ones, often being part of growth strategies. The failure rates of

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portfolio enterprises in their study were very low. Portfolio ownership was present across all business types, but more common among substantial and incorporated companies. The success of the portfolio firms was not only associated with conventional growth factors, but extensive multiple linkages at director level were also found. Their study also pointed out, that there is definitely a need to use the cluster of firms owned or managed by a single entrepreneur as a unit of study, rather than study only the performance of single firms.

From a different stance, Robson et al. (1993) studied the effects of diversification on small business performance and survival in the UK with a large quantitative panel dataset. They defined small businesses to be companies with less than 200 employees, and divided companies into 12 different categories according to their size. Each group comprised diversified and non-diversified firms. A company was considered to be diversified, if it had two or more economic business entries and at least 10 per cent of that company's turnover resulted from each line of its business enterprises. Companies were also classified through the direction of diversification (vertical, horizontal or conglomerate type of diversification). According to their results, the probability of being diversified correlated positively with the size of the business. There was no difference between the survival of firms, except in the group of the smallest firms, where diversified firms had the higher failure rates. This implies that diversification strategy is an effective risk management strategy only after a solid base has been established in the primary business. In fact, in very small firms entrepreneurs might also lack the relevant skills needed for the new diversification enterprise.

Until recent times, farms have often been excluded from small business studies concerning rural enterprises, mainly because the sector is perceived as declining (Carter 1996). However, lately theoretical approaches of portfolio entrepreneurship have been applied to diversified farms. Carter (1998, 1999) studied the role of farms in rural development from the viewpoint of diversification activities, and farmers' contribution to firm and employment creation. In her earlier study Carter (1998) found that a substantial proportion of farmers had engaged in business activities in addition to those of their farms. While the majority of farmers were looking for additional income through farm-centred diversification activities, others had started new enterprises on or off-farm. Portfolio owners were more likely to be younger and better trained and there were signs of increased strategic complexity of their portfolios. It was emphasised that in the future, the managerial strategies developed by farmers will be as complex and as successful as those created by other business-managers. Later Carter (1999) focused on employment created by farmers. It was found that additional business-owners employed more outside staff than structurally diversified farmers.

Rantamäki-Lahtinen et al. (2005) studied the long-term development of diversified farms in different entrepreneurial environments. They applied Spilling's general model of interaction between a farm and its environment, to data on diversified farms in different rural environments in Finland and England. Two areas in each country were selected to illustrate the remote versus peri-urban dimension. Data were based on semi-structured interviews and a holistic multiple-case approach. The results showed that a local entrepreneurial environment has a clear impact on strategic adaptation. Diversified farms adjust to changes in their local environment by altering their behaviour. For example, farms adapt by adding new lines of businesses to an existing business. Farms located in remote areas operate in larger geographical markets, whereas those in the peri-urban areas deal with local markets and specialised niche markets, offering innovative solutions and good quality services/products (Rantamäki-Lahtinen et al. 2005).

There are several studies from all over the world that have investigated why farmers have diversified in the first place, and whether they are happy with their chosen path. Polovitz (2001) studied motivations for agritourism among farmers and ranchers in Montana, US. According to that study's results, farmers/ranchers had multiple reasons for the diversification. The economic factors, such as agricultural income fluctuations, tax incentives and meeting the demand of growing recreational

markets, were important. According to Pascotto (2006) Italian farmers in remote areas met their objectives that were related to income generation, but had problems in exploiting the full potentials of diversification. Studied diversification activities rely heavily on agricultural resources, especially the agricultural work force. Hence, the needs of agriculture might hinder the development of other sectors. Rantamäki-Lahtinen (2004) studied diversification strategy and decision-making in Finnish diversified farms from the management perspective. Multiattribute value theory was utilised in the theoretical framework. Data were collected by postal survey and analysed by using multivariate data analysis. According to the author's results, the objectives for starting non-agricultural entrepreneurial activities on the farm were both opportunity and necessity driven. Decision-making for diversified farms is affected by strong economic interaction between the farm, non-agricultural activity and the farm household. Farm diversification could be implemented though vertical integration, horizontal integration or agricultural and non-agricultural enterprises might be unrelated. Findings suggest that existing (spare) resources affect the direction of the diversification. On those farms that had vertically or horizontally integrated agriculture and diversified enterprises, the initial objectives to diversify, were closely associated with existing spare physical resources such as already existing raw-materials and machinery. On the other hand, the use of existing know-how was more commonly utilised in those farms, in which there was no close link between agriculture and the diversified enterprise. Overall, respondents were quite satisfied with their diversification strategy. However, a large proportion of farms had problems with over-diversification, whereas only 25 per cent of the farms did not report any problems. Most farmers that participated in the study expected that their farm would continue to be diversified in the future. However, one-fifth of the respondents were going to re-focus back on agriculture and retire from non-agricultural activities.

Vesala and Peura (2002) and Vesala (2005) studied entrepreneurial identity among Finnish rural entrepreneurs from a socio-psychology perspective. In their study Vesala and Peura (2002) made a quantitative survey of three-study groups: diversified farmers, non-diversified farmers and other rural entrepreneurs. All three groups had similar entrepreneurial identities for the two dimensions of economic values and an appreciation of independence. For six other dimensions (growth orientation, risk taking, innovation, feeling of being an entrepreneur, believing in their own success and perceiving their own opportunities to affect successful outcomes), farmers had weaker identities than others. Diversified farms had similar identity characteristics to those of other rural entrepreneurs in most of the dimensions. The two exceptions being: believing in their own success and perceiving their own opportunities to achieve a successful outcome. A latter study (Vesala 2005) was a qualitative follow-up for the first study. The key finding was the number and nature of customer relationships, which explains the weaker identity found for these two sectors. Those diversified farmers that had many customers (such as is the case in many agri-tourism farms) had stronger self-confidence in the belief that they could affect the success of their business. On the other hand, many of those farmers that had only one or few customers and vertical relationship for the customer, (such as forest machinery contracting for big multinational corporation), often had feelings that they could not affect the success, and that they were very dependent on that main customer.

In her dissertation, Torkko (2006) studied farm diversification. The main objective of her study was to find factors by which a positive development of diversification could be promoted. The qualitative study was made by using hermeneutic methods and a case-study approach. The main results were that farmers had stronger skills in production compared to marketing, and that diversified farms did not have well-defined strategies. The study also confirmed the viewpoint that farm diversification is not a passing phase moving from agriculture to another kind of entrepreneurial activity, but is a deliberate way to make a living. Kujala et al. (2006) studied innovative business concepts among farmers that run diversified farm on the region/province of Etelä-Pohjanmaa in Western

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Finland. In their study, they used the triangulation of quantitative and qualitative data as a method. According to their results, the farmer himself is the key actor, when successful innovative business concepts are created. His ideas, know-how and confidence were the most crucial factors when ideas were developed into innovative products. In order to create business growth among diversified farms, resources that are based on innovation and environment should be more effectively used and attention should be especially paid to the focusing of these resources.

Alsos and Carter (2006) studied resource transfer from agriculture to other business ventures and their subsequent performance outcomes among Norwegian diversified farms. Their results indicate there is a substantial resource transfer, especially when the diversification enterprise is closely related to agriculture through horizontal or vertical integration. Farms that have relatively more resources, such as knowledge or office premises, also transferred more of these to new businesses. According to their study, resource transfer affects new ventures profitability performances both positively and negatively. Moreover, the transfer of physical resources enhanced the performance, but the transfer of know-how actually hindered the performance of the new venture.

1.3 Objectives

Most of the research covering on-farm diversification has concentrated on business start-ups or farm survival strategy. Resource allocation has not been in much focus yet. In this study the subject is studied from this particular angle. The subject of this study is the link between resources and the financial success of diversified farms from a farm management perspective. The key question addressed in this dissertation is: how different tangible and intangible resources affect the financial success of farms. The research questions are formulated as:

- What kinds of resources do diversified farms possess in general, and to what extent do farms use joint resources?
- Do these possible differences between farms affect their financial success?
- How does knowledge gathering, sharing and processing affect financial performance?
- How does over-diversification affect the financial success of the farms?

2 Theoretical background

The subject of this study is the resource allocation and the performance of diversified farms from a farm management perspective. Currently, little is known about how diversified small firms develop and are managed, and how different resources can be successfully combined. This study's theoretical background utilises resource-based theory, and also certain themes of the theory of learning organisation and also other decision-making theories. In this chapter these theories are introduced.

2.1 Resource-based theory

Strategic management has traditionally focused on business concepts that affect a firm's performance. Many early strategy scholars, such as P.W.S. Andrews, Igor Ansoff and Edith Penrose were mainly interested in firms' internal resources and their contributions to firms' success. In the 70's and 80's the focus shifted toward the external factors.

Industrial organisation economics (IO) and other approaches that consider the structural aspects of the industry, and the competitive position within industry, became dominant. This was especially due to the work of Michel Porter (Hoskisson et al. 1999, Forsman 2004). The focus shifted back to inter-firm resources during the 80's and 90's when the framework of resource-based view was developed (Hoskisson et al. 1999).

'Resource-based theory' combines two different approaches: a management perspective and an economics perspective. It can provide resource-level and firm level explanations for sustained performance differences among firms. However, it cannot be used for industry-level analyses, hence it is complementary to the game theory and Porter's 'diamond theory' (Peteraf and Barney 2003). Moreover, RBT's roots lie in the conventional study of following distinctive competencies: Ricardian economics, the study of the anti-trust implications of economics, and especially the work of Edith Penrose in 1950's known as 'Penrosian economics' (Barney and Arikan 2005). In the 1980's and early 1990's the seminal studies of Wernerfelt (1984), Peteraf (1993) and Barney (1991) created the *resource-based view.* There have been critical discussions regarding some of the basic assumptions, whether resource-based view is a theory at all. These covered the topics of: idiosyncrasy of resources and generalizing the results to wider firm population (Gibbert 2006b, Gibbert 2006a, Levitas and Ndofor 2006). Nevertheless, during the past two decades the 'view' developed into a 'theory' via numerous studies that were subsequently published in a wide variety of journals and researched in many disciplines (Barney and Arikan 2005). In this dissertation the terms resource-based view (RBV) and RBT are used as synonyms.

2.1.1 Core definitions and assumptions of the resource-based theory

In RBT the firm is defined as a collection of resources (Penrose 1995). These resources and the products of the firm are 'two sides of the same coin,' most products require several resources (Wernerfelt 1984). On the other hand, most resources can be used in different ways, and a firm can seek new competitive advantages by using these resources in new ways, and turning them into new products or services (Coates and McDermott 2002). Although at the beginning the RBT was developed in the context of industrial firms, it has also been applied to service industries such as tourism (Haber and Reichel 2007a). Hence, the 'products' of the firm can be understood either as substantive physical products or services or combinations of both of these.

Economic rent and competitive advantage

One of the key terms in economics generally, and especially in RBT, is the *economic rent* and rent-generating ability of the resources. An economic rent is determined as '*a payment to an owner of a factor of production in excess of the minimum required to induce that factor into employment'* (Barney and Arikan 2005). In other words, rent is the surplus of revenue over the real or opportunity cost of resource in generating that revenue (Grant 1991) and it can sometimes simply be defined as the equivalent to the entrepreneurial profit (Montanye 2006).

A competitive advantage is defined as the situation in which a firm is able to create more economic value than it's break-even rivals. A simple example of this situation (Fig. 2.1) has been defined by Peteraf and Barney (2003). Firms A and B are competing single-business firms. Firm A is able to create 180 and firm B 150 monetary units of economic value per unit of output. Firm A and firm B both deliver same level of benefits to the customer (100 monetary units). However, firm A has 80 monetary units of residual value, i.e. value that is left over after consumers have got their share of total value, and firm B has residual value of 50 monetary units. Now, firm A has positive differential in residual of 30 monetary units. Thus, firm A has a competitive advantage over firm B, and this advantage provides a protective cushion for A against the competition from B. Accordingly, economic rent can be also defined as: *'returns on the factor in excess of its opportunity cost'.* In order to create a competitive advantage, a firm must produce greater net benefits

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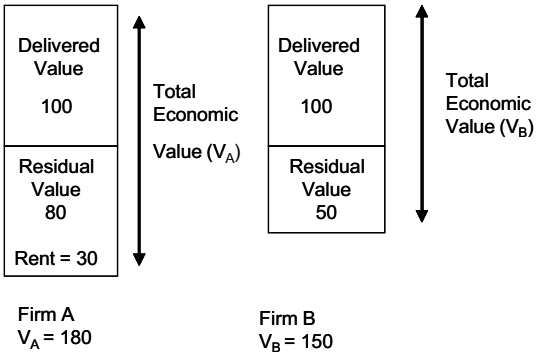

Fig. 2.1 Rent generation through greater total economic value (Peteraf and Barney 2003).

through superior differentiation and / or lower costs than its competitor (Peteraf and Barney 2003).

Bowman and Ambrosini (2007) raise the issue of competitive *dis*advantages, which are factors that have a negative influence on profits. Simultaneously, the same resource can cause competitive advantage and disadvantage. Sometimes competitive disadvantage can even outweigh the positive impacts of the resource. For instance, a diversified farm can process high-value products from its own raw materials, but these products might have only limited market channels. Bowman and Ambrosini (2007) divide competitive advantage into three groups; 1) cost advantage, which means that a firm's unit costs are below the average for that industry, 2) premium pricing advantage, means that the perceived use value (for the customer) is higher than its competing products, and thus a firm can price higher and enhance profit flows. The final option: 3) is the case of superior sales volumes, which means that the perceived use value for the product is high, but a premium price strategy is not selected. If costs are equal to industries' average superior sales values, increased volumes lead to superior profit flows, and a firm might be able to develop these scale and experience-based resources.

Determination of the resources and capabilities

In RBT it is seen that firms possess or comprise 'bundles' of' heterogeneous resources. In the literature the *resource* has numerous definitions. In can be defined broadly as inputs into the production process (Grant 1991) or as tangible or intangible assets that firms use to develop their strategies (Barney and Arikan 2005, Ray et al. 2003) or assets that are tied semi-permanently to the firm (Wernerfelt 1984). In some cases a firm's resources include everything; all assets, capabilities, the firm's attributes, information, knowledge and controlled by that firm The term can also refer only to very specific resources such as a certain piece of equipment (Forsman 2004).

The terms 'resource' and 'capability' have sometimes confusing and overlapping definitions and sometimes quite opposite views are presented. Some scholars, Ray et al. (2003), Barney (2005) and Wernerfelt (1984), use the terms interchangeably. Makadok (2001) describes capability as just one resource type: '*specific, an organizationally embedded non-transferable firm-specific resource, whose purpose is to improve productivity of the other resources possessed by the firm*'. Capabilities cannot usually be bought in from markets; they can only be created by firms themselves. *Resource-picking* ability is a firm's ability to select resources more effectively than its competitors, create economic rents before acquiring the chosen resource. On the other hand, a *capability-building* mechanism is a firm's capability to use its other recourses to create economic rents, or create economic rents after resources are acquired. The resource-picking ability affects decision-making and capacity-building ability has an impact on the implementation or deployment phase. Results of both these rent-generating mechanisms are generally used in the management. They are complementary to each other in some situations and in other circumstances used as substitutes.

The opposite of these views were expressed when some authors noted that capability is not a resource. For instance Grant (1991) defines resource as an input and capability as a capacity for a team or resources to perform a task or activity. Carbrera-Suárez et al. (2001) conclude that capabilities refer to a firm's capacity to deploy resources and they are information-based, tangible or intangible processes that are firm-specific and develop over time through complex processes. Unlike resources,

capabilities are based on developing, carrying and exchanging information through human capital.

Resources can be classified in different ways. Penrose (1995) defined the firm as a collection of administrative and productive resources and divided the latter into *physical* and *human.* In her famous book 'The theory of the growth of the firm' she derived a firm's growth from use of these resources. There are several other typologies of resources as well. For instance, Barney and Arikan (2005) and Ray et al. (2003) define resources as the *tangible and intangible assets* that firms use for their strategy planning and implementation. Tangible assets can be understood as: *'physical and material assets, which can be precisely valued or measured'* (Oxford English Dictionary 2006). Similarly tangible resources are understood in this dissertation as: physical and material resources. On the other hand, intangible assets are assets that '*cannot easily or precisely be measured'* (Oxford English Dictionary 2006). Intangible resources can be understood as resources such as innovation that cannot be measured. Locket and Thomson (2001) categorise resources as either: *static,* a stock of assets that are to be utilized as appropriate over a finite life, or *dynamic,* which may be inherent in capabilities, e.g. an organisation's capacity for learning.

There is a common understanding among researchers that the focus should be on valuable*, or critical,* resources and capabilities that have a significant positive effect on costs or perceived benefits (Peteraf and Barney 2003). Hence, they should be able to enhance a firm's performance. Some researchers define: those resources and capabilities that are inelastic in supply as *valuable* (Ray et al. 2003). On the other hand, Barney (2005) defines as being valuable those resources and capabilities that enable a firm to develop and implements strategies that are able to lower its net cost and increase revenues beyond the stage, where these resources were no longer available. The resource's value could also be defined by its ability to enable the firm to envisage and implement suitable strategies for the markets. An important notion is that possessing valuable resources does not necessarily ensure that a firm's performance is superior. Barney (1991) states that only those resources that are: 1) valuable, 2) rare, 3) imperfectly imitable and 4) have no equal substitute have the capacity to build a sustained competitive advantage. Later this approach became known as the VRIS-model. Bowman and Ambrosini (2007) summarise a range definitions of valuable resources pragmatically as being those that permit premium pricing or enables lower cost structure compared to a firm's competitors. In short, one can define valuable resources as being scarce, non-substitutable and inelastic in supply. In addition a valuable resource can affect a firm's performance in two ways, either by increasing the value of a product to the customer and allow higher pricing, or by reducing costs and hence leading to larger profits.

These critical resources are important for their value generating ability and their scarcity. The former means that they are vital for the firm's effort to generate greater economic value. If critical recourses do not exist, then the value could disappear. The critical resources are also often the limiting factors in determining how much demand the leading firm is able to satisfy. They are often scarce, because supplies of this kind of resources might be insufficient. Scarcity of these superior factors affects the competition as more and more marginal factors are drawn into production. Therefore the scarcity of critical resources might be only temporary. On the other hand, sometimes they are permanent due to inelasticity in supply (Peteraf and Barney 2003).

Peteraf and Barney (2003), among many other authors, stress the importance of the rent generating ability of resources. Their summary of the connections between resources and economic rent are presented (Fig. 2.2). The superior critical resources allow firm to function more efficiently, i.e. by lowering cost per produced item or get higher benefits from consumers. This allows greater net benefits so the firm will gain a competitive advantage over its competitors in the same markets. This situation allows a firm to gain more residual value for the same delivered value when compared to its rivals. In addition, the difference of residual values between competitors equals that of rents.

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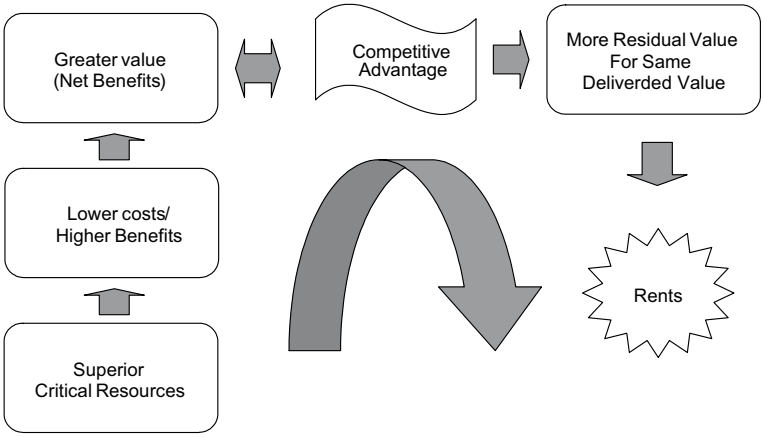

Fig. 2.2 Peteraf and Barney (2003) chain of logic from resources to rents.

How resources have been understood in this study

In this study, resources are quite broadly understood as tangible or intangible assets (Barney and Arikan 2005, Ray et al. 2003) that are tied semi-permanently to the firm (Wernerfelt 1984). In diversified farms these types of valuable tangible resources can be entities such as: raw materials produced on the farm and used for processing; or machinery and also the premises. Valuable intangible resources can be items such as professional and managerial skills of the farmer.

Basic assumptions of RBT

According to Barney and Arikan (2005) many basic assumptions of the RBT are similar to those of other theories of persistent superior performance. For example, the proposition that the firm is a profit-maximising entity is assumed. However, the firm is not *inter alia*: a set of agents, or that the managers of the firms are bound rationally[5]. Actually RBT has only two fundamental assumptions that differentiate it from other strategic management theories. These assumptions have been given by Barney and Arikan (2005) and are:

1. Resource heterogeneity
2. Resource immobility

Heterogeneity of available and potential resources gives each firm its unique character (Penrose 1995). However, RBT does not make the assumption that all firms will always have unique resources that are strategically important. It is actually assumed that some firms may possess valuable resources that enable them to develop and implement strategies to those of competitors (resource heterogeneity) and these resource differences may be continuous i.e. resource immobility (Barney and Arikan 2005). Peteraf and Barney (2003) underline the fundamental meaning of the assumption of the heterogeneity. Without differentiable resources, RTB makes no unique theoretical contribution of its own.

2.1.2 Positioning resource-based theory relative to other theories

Resource-based theory has been positioned relative to other theories. Barney (2001) states: 'that one should actually discuss different resource-based

5 Bound rationality means that while decision-makers might want to act rationally, they have only limited time, knowledge and computational power when they make decisions (Gigerenzer et al. 2002, Grover and Malhotra 2003).

theories according to their positioning in relation to each other'. Therefore RBT can be applied in different ways. The application depends mostly on its empirical context. Barney (2001) sets three alternative theoretical approaches; 1) positioning RBT relative to strategic management and especially theories of competitive advantage, 2) positioning RBT relative to neo-classical microeconomics and 3) positioning it relative to evolutionary economics. Furthermore, Lockett and Thomson (2001) identified two other relevant economic theories concerning RBT, these are transaction cost economics and the positive theory of agency. On a more specific level, Alvarez and Busenitz (2001) point out different dimensions; the RBT relative to entrepreneurship theories.

Resource-based theory positioned relative to strategic management

The most dominant theory in the literature is that RBT has been positioned in regard to its strategic management. It was already described by Barney (1991) and Peteraf (1993) and today this positioning is principally used regarding resource-based theory. The key question in strategic management is how firms achieve and sustain competitive advantage in markets (Teece et al. 1997). Grant (1991) linked the resources and capabilities to long-term strategy, resources and capabilities in order to provide the basic direction for strategy. Thus, they are also the primary source of the profit, which one could also understand as the success of a farm's enterprise. Grant (1991) described the framework of the resources as being the basis of profitability (Fig. 2.3). The framework is very applicable for understanding the relationship between strategy, resources and the performance of an enterprise.

In empirical studies, this type of positioning of RBT and strategic management is used as a means of determining, which resources offer a source of competitive advantage (Forsman 2004). It also determines sustainable profitability differences that cannot be explained under industry conditions (Peteraf 1993). Competitive advantage means that the firm implements a value creating strategy that is not implemented by current or potential competitors. A sustained competitive advantage means a strategy that fulfils the criterion of competitive advantage while the current or potential competitors are unable to provide the same benefits of the chosen strategy (Barney and Arikan 2005).

Resource-based theory positioned relative to other theories

RBT can be positioned relative to neo-classical micro-economics (Barney 2001). This kind of positioning is used less than positioning related to strategic management. Even so, RBT and micro-economics are strongly linked with each other and share many similar basic assumptions. Actually, the biggest difference between these two theories is that in neo-classical microeconomics, it is generally assumed that resources have elastic supply properties. In contrast, in the RBT it is fundamentally assumed that there are at least some resources whose supply are inelastic (Barney 2001). According to Locket and Thomson (2001) the explicit use of RBT in economics has been limited, but the central ideas behind it have become widespread. It has been recognized that inter-firm variations are at least as important as those of inter-industry differences and a firm's development is also path dependent i.e. 'today's decisions depend upon yesterday's decisions'. Hence, because each firm's resource bundle is different, its opportunity sets are proportionately different.

Transaction cost economics (TCE) and the positive theory of agency (PTA) have also been recognised as being relevant in relation to RBT (Lockett and Thompson 2001). TCE focuses on optimizing the cost of transactions (cost of economic exchange), and views the firms as governance structures rather than production functions. Key assumptions are opportunism, i.e. human actors in the exchange relationship might also have selfish objectives, and bounded rationality (Grover and Malhotra 2003). In contrast, PTA focuses on two factors: the characteristics of people and the characteristics of the innovation activities. The former refers to the difference in interests among individuals and the latter to uncertainty and information asymmetries. The theory views a firm as

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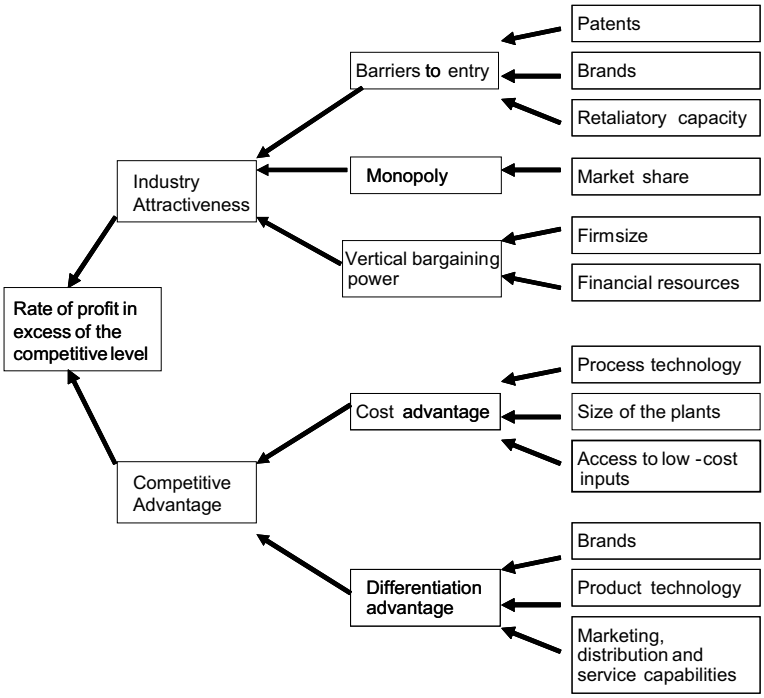

Fig. 2.3. Grant (1991) Summary of relationship between resources and profitability.

a nexus of unions of a set of agents, such as: the owners of the productive factors, with different interests. Among these agents are: owners, managers, shareholders, bondholders, workers, suppliers etc. (Galende 2006). Both theories share *assumption of opportunism* and try to define the efficient set of institutional arrangements in order to minimize organisational and production costs. RBT is not predicated on opportunism. However, according to Mahoney (2001) opportunism should be included into the theory. If it is absent, the rent-generating firm has no central reason to exist.

The theories RBT, TCE and PTA discussed above are complementary to each other. For instance, it has been argued that RBT is 'a theory of firm rents' that attempts to describe the market frictions that would lead to growth and sustainable rents. In contrast, TCE is 'a theory of existence of the firm'. It seeks to describe the market frictions that explain the existence of the firm (Mahoney 2001). There are several cases when it would be ideal to combine insights of RBT with TCE or PTA in analyzing choices that a firm faces. For instance, in situations where it is not possible to separate decisions concerning the use of resources from decisions concerning their governance, a combination of these theories would be advantageous. Another example is the situation, where specific non-imitable resources are likely to have high transaction costs. The combination of RBT and TCE could be appropriate to describe this (Lockett and Thompson 2001).

Barney (2001) also brought up ideas that link evolutionary economics and RBT. Evolutionary economics is derived from natural history and Darwinian thinking. Firms, industries and economies develop through gradual adaptation. The *variety and diversity* of firm strategies and routines is just as essential for economic evolution, as it is for biological evolution. *Selection and sorting* implies the situation that firms are more effective, more 'fit' to survive or grow within the industry or just be in the

right place at the right time. This might be especially the case in the situation in which external shocks to an economy occur (van den Bergh and Gowdy 2000, Barney 2001). When the successful strategy or idea has been launched, others follow the pioneers and the competitive process within economic framework starts all over again (Metcalfe 2004). Of course, biological and economic evolution processes do differ significantly. The pace of the change is a lot faster in economic evolution or Lamarckian evolution. Economic evolution involves learning, and occurs on various levels, whereas in biological systems such learning it is often missing (van den Bergh and Gowdy 2000). These kinds of effective routines that create sustainable competitive advantage ('survival of the fittest') are indeed valuable resources of the firm. There are also other common denominators between evolutionary economics and RBT; *heterogeneity, competition, superior performance* and *sustainable competitive advantage* are essential parts of both theories (Barney 2001). Both theories study path-dependent development of the firm (Lockett and Thompson 2001).

The RBT underlines the importance of human resources. However, entrepreneurship has often been excluded within the framework of RBT (Alvarez and Busenitz 2001). Incorporating entrepreneurial elements into the framework would certainly give the opportunity to exploit human resources from a different angle and more deeply. For example, as Alvarez and Busenitz (2001) argue, abilities such as entrepreneurial recognition, insight, entrepreneurial knowledge and the process of combining different resources are themselves valuable resources in their own right. Similarly, according to Casson (2005) the theory of entrepreneurship emphasises that a manager's entrepreneurial ability is the most important human resource for a firm. All other resources, especially human resources, are derived from those of the entrepreneur's since he is the one who selects these people. Casson (2005) also argues that one of the most important forms of entrepreneurial activity is the ability to identify a market-making opportunity: in particular the identification of changes in demand and creation of a new market to meet needed demands. In addition, many entrepreneurs have an important ability to influence different institutions, i.e. 'dealing with laws and regulations' (Montanye 2006). This entrepreneurial networking and ability is a valuable resource especially within a local setting.

The firm, the industry or entire economy adjust to changing conditions either by *adaptive response*, which involves using the existing tools in conventional ways or by *creative response*, which involves doing something that has not been done previously and is different from existing practice. Management involves leading an administration and running the enterprise. Entrepreneurship can be strongly linked with innovation and defined as the ability to perceive new opportunities and the ability to have adequate will power to break down possible resistance of the environment, i.e. 'the ability to make things happen' (Schumpeter 1947). According to Metcalfe (2004) an adaptive response is: *'stewardship of existing resources within the existing state of knowledge'* i.e. management, and creative response can be viewed as entrepreneurship.

However, in the terms of defining valuable entrepreneurial resources, or entrepreneurial thinking as a valuable resource, there are some theoretical considerations to be made. If entrepreneurship is specifically studied within the RBT framework, then it is important to draw a theoretical distinction between management and entrepreneurship. Managerial ability and entrepreneurial ability should be seen as distinct human resources, and in empirical analysis they should have different metrics. On the other hand, both concepts are often needed simultaneously to understand how the bundles of resources are controlled within the firm and how the firm develops. Many different business experiences influence managerial perceptions of entrepreneurial renewal and strategy development (Kor et al. 2007). Therefore entrepreneurial resources can also be included in the 'toolbox of needed management skills' of the entrepreneur, and thus need not be separate from other skills. In this study the focus was more on the managerial and professional skills of the entrepreneur.

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2.1.3 Diversification strategy, management and resource-based theory

'*... a firm is essentially a pool of resources, the utilization of which, is organised in an administrative framework. In a sense, final products being produced by a firm at any given time merely represents one of the several ways in which the firm could be using its resources, an incident in the development of its basic potentialities'* (Penrose 1995).

In this study the term 'diversification' covers two different strategies. Diversified farms can be categorised as either: the 'diversified type' or they can be the 'portfolio type'. The former is a farming firm that comprises two or more business economic sector entries within the same company (Robson et al. 1993). The latter describes a portfolio of firms, i.e. the same owner-manager simultaneously runs several firms (Carter 1999). Diversification provides a lot of advantages for a firm. Firms diversify into other businesses in an effort to: reduce risk, or reduce dependence on certain products or markets; capitalize opportunities; seek synergies in terms of markets, products or technology; strive for aggressive growth; gain power through market or market; and capital access or reflect owner's/ manager's aspirations and goals (Sambharya 2000). Penrose (1995) states that even thought it might be true for most lines of production, that productivity and costs would *ceteris paribus* be lower in specialised firms, it is only limited to the determination of the most profitable use of its resources in *changing conditions*. The changing nature of the business opportunities provides a firm's potential to invest in new things, while maintaining its current lines of businesses.

There are also several problems in diversification strategy. Therefore in order to perform well, a firm must overcome these problems. Diversification strategy has several risk elements, and entering into different markets is obviously a risky business (Markides 1997). *Multi-market competition* refers to the situation in which the same firms operate in the several of the same markets. This kind of situation might affect the managers' decisions. A manager might be less willing to compete aggressively in one market, if he/she knows that his/her firm's competitors might try to 'get even' in another mutual market. This kind of moral hazard is known as the 'mutual forbearance hypothesis' (Bergh 2005). *Over-diversification* refers to the situation in which a firm diversifies beyond its optimum limit, and the point at which the diversification starts to have negative effects on both profitability and the respective firm's market value (Markides 1995). As diversified farms are often micro or small businesses, they have only limited resources to expand into new areas. If resources are in general efficiently used, new ventures or expansion will decrease the resources available for 'old activities'. This might negatively affect their performance (Haines and Davies 1987). If a farmer underestimates the time it takes or the capital needed to run a non-farm enterprise, he/she might end up in a situation where the resources at his or her disposal are spread very thinly, and are not effectively used. However, situations where capital, or some other resources is limiting, are not necessarily caused by over-diversification. Consider a farm that has been using its resources very efficiently and experiencing only a temporary shortage of a critical resource, while achieving business growth. Such constrained growth can be viewed as growing phase and that farm will achieve more success later. For instance, bootstrapping can be defined as maximising the use of resources. The motivation for bootstrapping can brought about by through: the conscious striving for frugality, finding creative ways to avoid external financing, reducing overall costs, or improving cash flows (Ebben and Johnson 2006). Adizes (1988) has identified that diversification strategy is typical among firms that are going through a certain phase of their growth. It is, in some cases, a very good strategy though companies often also expand too fast and by too much. Consequently, acquired knowledge and systems of these enterprises will not grow in parallel with their size. It is assumed that over-diversification is a more relevant problem for diversified farms, than multimarket competition, as they are predominantly small businesses. Most of them do not have enough market power to be susceptible from the mutual forbearance hazard.

Diversification strategy is certainly one of the oldest and central strategy issues in strategic management literature, although it has not been under much of a focus in small business studies. Earlier the industrial organisation economics was dominant theoretical perspectives in diversification literature (Bergh 2005). More recently, RBT has been used to explain diversification strategy, as it is a theory that is fundamentally concerned with the internal accumulation of assets and with asset specificity. It is also, though less directly, involved with transaction costs. Moreover, RBT has a very significant advantage in that it works as a unifying theory that allows an observer to view both related and unrelated diversification through a common lens (Peteraf 1993). Furthermore, RBT has been used as a theoretical framework to analyse diversification in other disciplines than strategic management. For instance, Lockett and Thomson (2001) mention that the most successful applications of RBT in economics are to be found in the studies examining patterns of diversification via new market entry.

RBT has drawn attention from product-market actors onto resource factors. In addition, RBT has been applied to diversification strategy in different ways (Bergh 2005):

1. RBT can provide an explanation for the limits of firm growth. It suggests that a firm's human and physical resources limit the markets to which that firm can enter in order to realise its ability to produce, fund needed investments and manage growth.

2. RBT can provide explanations and reasons for why firms diversify. For instance utilizing surplus of capacity.

3. RBT can provide underlying principles for direction of the diversification.

4. RBT can provide explanations for the relationship between performance and chosen diversification strategy. In particular, the theory explains how resources that are associated within certain diversification types are related to performance.

5. RBT can provide explanations for portfolio level relationships and how such linkages can be used to explain financial performance.

6. RBT can also provide new insights for the efficient management of diversification strategy.

Markides (1996) stress that diversification will only enhance performance, if it allows a firm to obtain preferential access to critical resources that cannot be purchased or replaced by its non-diversified rivals. Even if such a case does exist, the advantage will eventually perish when non-diversified competitors imitate them and asset erosion affects these resources. One of the most important ways to obtain new strategic assets or critical resources is to accumulate them through experience; 'learning by doing'. A diversified farm might have the possibility to use its former experiences when it is creating new critical assets or core competences in other fields. Thus it derives long-term benefit from this kind of 'dynamic relatedness'. According to Robins and Wiersema (1995) in order to gain sustainable competitive advantage by sharing these critical resources between different lines of industry, the firm must also have an organisational structure that is more efficient in realising the benefits of sharing, than the alternative transaction modes used by competing non-diversified firms.

As stated earlier, RBT is a theory that links economics and management (Peteraf and Barney 2003). In addition, an operation that a firm can do is not just a function of the opportunities it confronts; it is also dependent on what resources it can gather together (Teece et al. 1997). This close connection between management and resources can be seen in the flow chart (Fig. 2.4) created by Perry et al. (2005). In this kind of framework, the focus is on *how* the firm bundles its resources instead of what actual resources it possesses. RBT as an account of the administrative decisions that convert resources (R_i) into services. These decisions may include 1) re-organising existing resources i.e. 'rebundling', 2) adding new resources to the firm, 3) discharging resources 4) refocusing resources, or combinations of all the above. Services within the firm are generated as a result of the above decisions. These serv-

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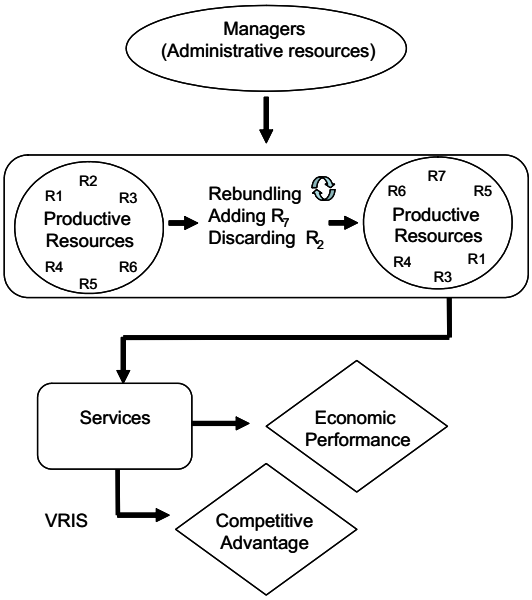

Fig. 2.4 RBV logic flow by Perry et al (2005).

ices may result in the competitive advantage and possible superior economic performance, if they meet the criteria of VRIS-model (Perry et al. 2005). The competitive advantage in the framework does not have a causal link to economic performance, thus the model is different from many others.

RBT avoids a number of methodological and substantive problems associated with many other approaches that analyse corporate portfolios. For instance, the determination of the interrelationship between certain types of industries is one such problem. It is also proven to be a significant approach in explaining the financial performance of diversified *large manufacturing* firms (Robins and Wiersema 1995). Hence, it is theoretically promising in respect of farm, small business, and family business research (Cabrera-Suarez et al. 2001). To date not many studies using RBT have been published on farms and small businesses, however. Pascotto (2006) states that diversified enterprises of Italian farms significantly contribute to total farm revenues even though the majority of the working times are still spent on agricultural enterprises. This is due to the use of agricultural resources in the diversification activity, i.e. *joint resources*. Alsos and Carter (2006) studied resource transfer from agriculture to other business ventures. Their results indicate there is a substantial resource transfer, especially when the diversification enterprise is closely related to agriculture through horizontal or vertical integration. Torkko (2006) also studied resource transfer from agriculture to other ventures in Finland and found similar results. Cabrera-Suarez et al. (2001) argue that family firms have some resources that have brought them competitive advantages in markets. For instance, these 'family business type' of critical resources are the high degree of commitment and dedication to the farm by family members and employees. This also includes the quality and trust that are often a characteristic of family businesses.

Thus, by using RBT farm diversification can be approached from very different angles from many traditional approaches. For instance, in past decades agricultural economics has predominantly focused on how to produce certain products efficiently by minimising costs or increasing output in order to generate increased returns for a specific product in its respective market (Micheels and Gow 2008). Advantages and disadvantages of farm diversification are difficult to measure in these terms. By using RBT, the whole setting can be turned around. Now the focus is on inner resources of the farm, and links this perspective to: innovation, entrepreneurial orientation, business growth and financial performance. This might lead to new opportunities and success. This is because the use of resources can be renewed and new markets and also products can be found.

2.2 Learning enterprise approach in respect of resource based theory and diversified farms

We are living in the information society, where the operational environment is undergoing continuous volatile change. According to Casson (2005) an economic environment is continually subjected to short and long term, general and specific shocks.

In this sense, volatility and costs are actually both sides of the same coin; the continuous flow of information is needed to keep the picture of the environment up-to-date. To maintain this needed information at minimum cost it, it is appropriate to make the information collection and processing more discriminating. Learning, knowledge gathering, sharing and processing are essential to any sector of life today. This is especially so for small businesses, though not much research concerning issues such as organisational learning has been conducted in entrepreneurship studies (Harrison and Leitch 2005).

In the context of this study information can be defined as: '*the action of telling or fact of being told of something'* (Oxford English Dictionary 2006). Knowledge can be understood as information that is relevant, actionable and at least partially on experience. There is a difference between knowledge and learning, the former being the *content* that an organisation possesses (Easterby-Smith and Lyles 2003) and the latter means the *process* by which that knowledge is acquired (Andrews and Delahaye 2000, Harrison and Leitch 2005).

There are several different ways to approach knowledge and learning within organisations. Organizational learning can be determined as: *'the development or acquisition of new knowledge or skills in response to internal or external stimuli that leads to a more or less permanent change in collective behaviour and that which enhances organisational efficiency and/or effectiveness.*' (Spicer and Sadler-Smith 2006). Organisational learning studies are concerned with the learning processes of and within organisations (Easterby-Smith and Lyles 2003). On the other hand, the term 'learning organisation (enterprise)' means: '*an entity, an ideal type of organization, which has the capacity to learn effectively and hence to prosper*' (Harrison and Leitch 2005). Moreover, learning organisation studies are often concerned with issues related to how to enhance and create such learning capacity and therefore have more practical aims (Easterby-Smith and Lyles 2003). Nevertheless, both of these theoretical approaches, organisational learning and learning organisation, relate to the process of learning. According to Easterby-Smith and Lyles (2003) there is a similar dichotomy within research concerning the content i.e. knowledge. *Organisational knowledge studies* aim to understand and to conceptualize about the nature of knowledge that is contained within the organisations. The *knowledge management studies* aim to create ways to disseminate and control knowledge in order to enhance the performance of the firm.

Although organisational learning occurs through the individual members of an organisation, it is more than the sum of learning of these individual members (Mahoney 1995). DiBella (2003) views the organizations as the learning portfolios more than just learning organization. He argues that just like individuals, firms also learn in different ways, and to some extent these differences are caused by their operational environments, history, culture, size and age. Small, new entrepreneurial firms within a turbulent business environment probably learn differently from large well-established corporations. Some organizations have just one dominant learning style, but most of them have variety of styles. Furthermore, a large portfolio of styles is apt to have multiple competencies and critical mass in order to adapt the changes compared to those firms that have only one style. Thus, learning styles can be seen as one of a firm's core capabilities (or resources) that are central and acquired. DiBella also claims that in order to create a competitive advantage from this resource, members of the firm must first recognize what any particular capability is made of. Identifying the current situation provides the starting point for further development in strategies. A summary of central differences of 'the learning organization' and the learning portfolio' DiBella (2003) is shown (Table 2.1).

Bergh (2005) emphasises that theories of organisational learning should also be applied to diversification strategy. Organisation and its actions reflect prior decisions and experiences. Managers learn from earlier diversification experiences, and these prior experiences should create a knowledge basis so they can be use for future decisions. Firms that expand in ways and directions they are already familiar with would be expected to perform better than those firms that do not.

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Table. 2.1 Differences between learning portfolios and learning organisations (DiBella 2003).

Variable	Organisations as learning portfolio	The learning organization
World	Uni-modal world; all organizations have learning capability	Bi-modal world; some organizations learn and some do not
Source of learning	Organizational existence	Strategic action promotes the prerequisite conditions
Culture	Culture is created and survives through embedded learning processes	Organizations must have the right culture for learning to occurs
Organizational homogeneity	Heterogeneous: Complex organizations have different structural units and sub-cultures.	Homogeneous: organizations learn systemically or they do not
Learning style	Multiple, complementary, or in conflict	Processes are singular and specific
Managerial focal point	Understanding and appreciating current capability	Innate organizational disabilities, which prevent learning.

Knowledge - based view

One example of the knowledge management approach is the knowledge-based view of the firm. It is an extension of RBT in that it conceptualizes firms as being heterogeneous knowledge-bearing entities (Hoskisson et al. 1999). Knowledge is a very valuable intangible resource, it grows for the reason that each individual reacts in their own ways even for the same information then passes on their new thoughts in a continuous process (Metcalfe 2004). The knowledge-based approach of a firm is an attempt to analyse how different organisations create, acquire, apply, protect and transfer knowledge. For instance, efficient knowledge sharing can be viewed as a critical resource of the firm. The standardisation of the 'within-firm language and codes', has been seen as one of the key tools to increase communication efficiency and stabilize operations: especially in large corporations. This standardisation has been seen in accounting systems, blueprints and other reporting systems (Mahoney 2001). For example, the quality manuals could be seen as one form of coding and attempt to share information within the diversified farm.

As learning is very much dependent on human resources, emphasis should be placed of personnel knowledge (Mahoney 1995). The personnel of diversified farms include the entrepreneur him/herself, family members and employed staff. Human capital, particularly the knowledge possessed by members of organisation with combination of technology, can be seen as the most fundamental critical resource of the firm (Itami and Numagami 1992, Hitt and Ireland 2002). Effective human resource practices and technical systems enable firms to retain existing and also build new knowledge and managerial systems that are required for creating and controlling knowledge (Mahoney 1995). In the entrepreneurial firms, knowledge and learning of the entrepreneur has specific meaning, as they influence the subjective opportunity set (Kor et al. 2007). This is particularly important in micro firms, because they usually do not have employed managers or an R&D department to help determine the future directions and opportunities.

According to the case study carried out by Andrews and Dealaye (2000) there are individual-level factors that will affect the knowledge sharing, processing and gathering. For instance, people choose from what sources they gather information, what information they accept and with whom they share it. As a result, organisational learning is highly dependent on the individuals within the organization. Cope (2005) underlines that entrepreneurship should be studied from a learning perspective. Learning is a dynamic phenomenon, and it is different at various progressive stages. For instance learning is different at the founding phase of the firm than at later phases of the firm's life-cycle. These stages are complementary and there

are firm specific and individual specific factors that will affect the learning and knowledge gathering and sharing within the firm.

Resource – learning view

Mahoney (1995) argues that learning theory and RBT should be combined. Although Penrose's seminal work did have elements that suggested that using the productive services of resources required learning: the theory of resources and also the theory of learning have both developed in isolation. Both theories have certain common elements, such as the assumption of heterogeneity. RBT alone cannot articulate management practises that will enable a firm to earn rents. Moreover, learning theory alone cannot sufficiently draw a line between strategically important and less important management practices. By combining these two different theories within 'a resource-learning theory of the firm'; the productive resources, administrative resources (Penrose 1995) and management practices are an integral part of theory of resource learning (Table 2.2).

Mahoney (1995) differentiates the concept of capability from that of a resource. However, even if this distinction is not drawn, and capability is seen as a specific resource (Makadok 2001) resource learning theory provides valuable ideas about how to combine learning, management and resources. Hitt and Ireland. (2002) argue that today's volatile operational environment requires prudent leadership and management Moreover, that leaders at all levels must acquire, develop and manage resources efficiently. This requires especially good tactics and an intimate knowledge of: the specific firm, its resources, operations, unique conditions and standard operating procedures. This kind of knowledge is unique and difficult to imitate, and if it is correct/appropriate, it can create a competitive advantage (Hitt and Ireland 2002). It is equally important to understand the operational environment of the firm. An entrepreneur is in the market system as an innovator who sees opportunities and then turns existing resources into new products and services. Organisational learning enhances, or enables, creativity and ability of identifying these new opportunities (Hyvönen and Tuominen 2006), and therefore prior knowledge of current situation is a necessary precondition for success.

Not only is the knowledge and learning possessed by individual managers, entrepreneurs and employers important; the knowledge must be appropriately communicated and flow between individuals as and when needed. Thus relationships between leaders/decision-makers and those whom they lead (*internal social capital*) are critical to the

Table 2.2 Mahoney's (1995) view on the resource-learning theory of the firm.

RBT	Organisational capabilities theory	Resource learning theory
Rents are derived from heter-ogene-ous resources	Rents are derived from heterogene-ous skills and mental approaches	Rents are derived from heterogene-ous re-sources and mental approaches that are intertwined
Rents are achieved by ac-cumulating better resourc-es via information asymme-try or luck	Rents are achieved by making better use of productive resources	Managerial skills in combination with other resources jointly produce rents
Resources should determine a firm's strategy	Organisational capabilities should determine a firm's strategy	Resources and capabilities should serve as a driver for strategy
'Managing' involves the ac-cumula-tion and deployment of resources	'Managing' involves enhancing core competencies	'Managing' involves a discovery proce-dure in which heterogeneous mental models of managers using heterogeneous firm spe-cific re-sources are involved in an ongoing competition

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success of the firm. Furthermore, the relationships between these leaders/decision makers with those outside the organisation with whom they need to interact to further the firm's interest (*external social capital*) can also prove to be critical resources for the firm. These relationships can provide access to crucial information, knowledge, technology, new markets etc. that might give a diversified enterprise a competitive advantage. Alternatively, they can sometimes simply contribute to an enterprise's survival (Hitt and Ireland 2002).

Diversified farm as learning enterprises

In this dissertation human and social capital, in addition to knowledge and learning of the entrepreneur are regarded as critical resources. Most diversified farms are micro or small enterprises. Many of them are family enterprises or run by just the entrepreneur him/herself or by the family. Thus the organisational structure is fairly simple, and many items are discussed over 'morning coffee' and complicated procedures are not needed for knowledge transfer. On the other hand, the personal learning styles of the entrepreneur (or his/her family) are even more important than those of the personnel of bigger firms.

As Finnish diversified farms are typically family farms that have been owned by same families for generations, there is very strong tactical knowledge about the resources of the respective firms combined with a lot of established ways of doing things, combined with knowledge about the past use of resources and also the consequences of past decisions. All these factors can be turned into competitive advantages. On the other hand, a problem might be the diversity and complexity of the needed information. Moreover, in the worst case, not all the necessary information from different lines of industries are gathered or processed. Skills and knowledge from other industries can be a very valuable 'joint resource,' but not all practices can be transferred to other lines of industries. Holcomb et al. (2009) argue that the heuristic approach of entrepreneurial learning is similar to that of decision-making, followed evaluation and learning afterwards (what worked and where did it go wrong?). Thus it will systematically affect the accumulation of knowledge. Therefore, if the farmer of a diversified farm relies too heavily on the learning systems created for agriculture, he might not find the most appropriate ways to accumulate critical information and learning processes from other industries. This is a potential threat because small firms usually cannot rely on their own research and development activities. Hence, SME's should try to be open to new ideas from very different sources and industries (Hyvönen and Tuominen 2006). To the best of the author's knowledge, learning and accumulation of information of diversified farms from this point of view has not been studied. Thus, it is important to study how information is gathered, shared and processed in the diversified farms. Moreover, it is important to explore how information gathering, sharing and processing links up with a firm's resources and, consequently a firm's success.

2.3 Theoretical approach to decision-making and resource-based theory

Decision-making can be hard because of its complexity, uncertainty of situations, or because a decision maker might be interested in working toward multiple objectives, but the progress in one direction might hinder development in another (Clemen 1996). There are alternative ways to approach decision-making problems. In the *descriptive* approach for decision-making the aim is to evaluate the decision-making processes. There are no *a priori* assumptions of rationality made by the decision-maker, but the aim is to find out how and why people make decisions in a real-life context. Descriptive models are evaluated by their empirical validity, i.e. how well they model and match empirical data. In *normative approach* the aim is to create abstract systems and models that show how 'idealized, rational, super-intelligent' people might behave. Normative models are evaluated by their theoretical sufficiency, i.e. what are acceptable criteria and assumptions of rationality or idealizations.

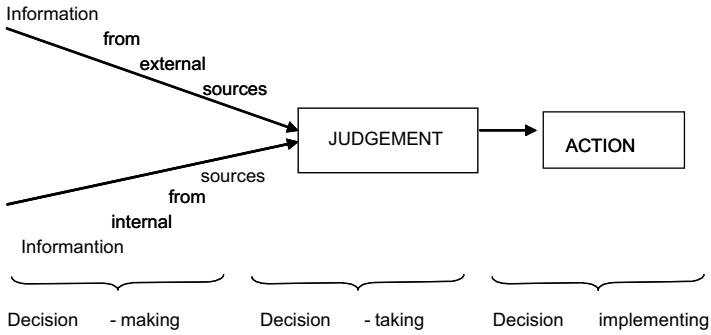

Fig. 2.5 The decision making process described by Errington (1986).

In addition, a third approach for decision-making can be: *prescriptive,* which means ways and systems helping people make better decisions. Prescriptive modes are evaluated by their pragmatic value, their ability to really help people in their decision-making (Bell et al. 1988, Clemen 1996).

In section 2.1.1 the central assumptions of RBT were introduced. In this section, two of them are looked at more closely from a decision-making perspective. First, Barney and Arikan (2005) state that bounded rationality is assumed with RBT. Second, Peteraf and Barney (2003) and Perry et al. (2005) among many other authors, stressed the importance of the rent generating ability of resources and superior economic performance as the prime objective of the firm. Bounded rationality means that the decision maker is constrained or bounded in time, knowledge and computational power. In addition, the environment varies with irregular informational structures (Gigerenzer et al. 2002). In the RBT context, it means that the decision-maker is dependent on the information he/she has got, and has only limited time to decide how to use available resources and what resources are critical.

One of the key issues of the decision-making is the objective that the decision-maker wants to achieve. He or she might simultaneously have multiple objectives, which might be disparate. For instance, according to Van Huylenbroeck et al. (2001) Potter (1992), Gasson (1993), Cuykendal (2002) and Duffy (2002) farmers have several simultaneous objectives. Gasson and Errington (1993) stress that family farm businesses are steered by many simultaneous objectives. Furthermore, different members of the family might have differentiated objectives. Despite these factors, it is formerly stated that according to the RBT, the objectives of the firm are economic success and gaining a competitive advantage in the markets. Therefore, the success of the firm is measured by financial criteria. In this dissertation descriptive and normative approaches are utilised. It is assumed that managerial decision-making process in diversified farms follows similar steps to those of farm family businesses in general. This decision-making process is dynamic and involves the steps of: setting the goals, information gathering during decision-making process, decision-taking, implementation, control and evaluation (Errington 1986, Castle et al. 1987, Gasson and Errington 1993, Clemen 1996).

2.4 Brief summary

RBT can provide resource-level and firm-level explanations of sustained performance differences among firms (Peteraf and Barney 2003). The firm is defined as a collection of resources (Penrose 1995). These resources and the products of the firm are as two sides of the same coin in that most products require several resources (Wernerfelt 1984). Resource-

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based theory has been positioned relative to other theories, such as strategic management, neo-classic economics, transaction cost theory etc. The term 'resource' can be defined in numerous ways, but the focus should be on the most valuable resources, i.e. those resources that have a significant positive effect on costs or perceived benefits (Peteraf and Barney 2003) and hence could be able to enhance a firm's performance.

Information and learning can be viewed as important intangible resources. Learning organisation theory explains the success of the firm from the learning perspective, learning organisation means '*an entity, an ideal type of organization, which has the capacity to learn effectively and hence to prosper*' (Harrison and Leitch 2005).

Decision making can be hard because of its complexity, uncertainty of situations, or because a decision-maker might be interested in working toward multiple objectives, but progress in one direction might hinder development in another (Clemen 1996). When decision-making is studied in terms of RBT, it is assumed that the decision-maker is dependent on information he/she has got, and has only a limited time to decide how to use available resources and which resources are critical.

Resource based theory analysis have drawn attention to resource factors rather than the product market actors. Moreover, RBT has been applied to diversification strategy in different ways (Bergh 2005). Thus, it can provide a fruitful theoretical starting point for a study on diversified farms. In this study, RBT is positioned close to strategic management in a small business context. Resources are quite broadly understood to mean tangible or intangible assets (Barney and Arikan 2005, Ray et al. 2003) that tied semi-permanently to a firm (Wernerfelt 1984). Entrepreneurial skills and learning are seen as important intangible resources. It is assumed that the goal of the decision-maker is financial success, and descriptive and normative approaches to decision-making are utilised.

3 Elaborating conceptual framework

The subject of this study is the resource allocation and the performance of diversified farms from a farm management perspective. The study is partly explorative and partly confirmatory in its nature. This study's epistemological approach is mainly positivistic in the sense that issues and phenomena are explained objectively by looking at the causal relationships between the reasons and outcomes (Burrell and Morgan 1987). However, it also has some subjective elements, for instance many survey questions are based on the subjective evaluation of the respondent.

3.1 Theoretical framework

Diversification strategy can viewed as a way of capturing rents by scarce resources (Teece et al. 1997), or as a result of matching a firm's resources to the prevailing set of market opportunities (Peteraf 1993). Thus, as this matching is essential for rent generation, the management and the organisational structure are crucial for diversifying the farm. Diversification can be seen in the light of the decisions made by managers (i.e. administrative resources) to impact on the use of resources and thus the performance of the farm. However, management is boundedly rational (Gigerenzer et al. 2002), diversified farmers use skills, knowledge and perceptions of factors that affect his/her judgement.

The theoretical framework of this study is presented (Fig. 3.1). The framework is based on earlier studies discussed in chapter 1 and theoretical views presented in chapter 2. The framework draws especially on the theoretical models of Errington (1986), Grant (1991), (Mahoney 1995) and Perry et al. (2005) and the empirical findings

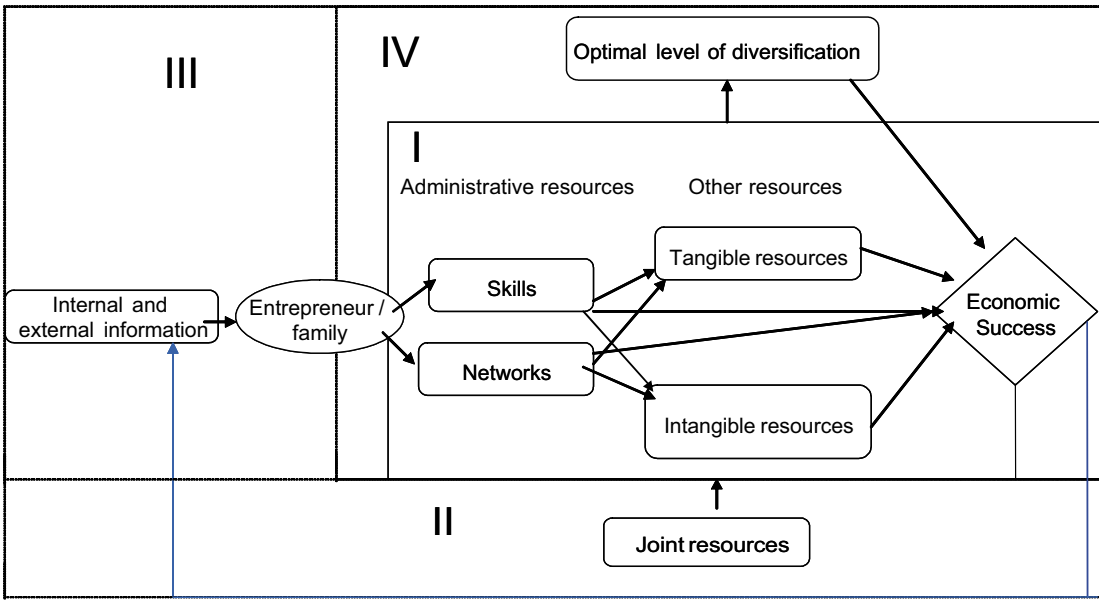

Fig. 3.1 Theoretical framework of the study.

of Rantamäki-Lahtinen (2004, 2007), Forsman (2004), Pascotto (2006), Alsos and Carter (2006) and Torkko (2006). In the framework it is assumed that a farmer or farming family makes decisions about the use of available resources within the diversified farm. Other resources mean all resources on the diversified farm, except the administrative (Penrose 1995), managerial and professional skill resources of the decision-makers. In the case of diversified farms there are resources that are linked to agriculture, some other resources linked to non-agricultural resources and joint resources. Overall resources affect success directly but also indirectly through the competitive advantage, but this is not taken into account directly. The availability of resources also affects the optimal use of resources, which consequently affects the firm's success. Finally, this model is path dependent: success affects decision-making, available resources and internal information. The decision-making is also affected by the knowledge gathering, sharing and processing. The limitation of this model is that it focuses mainly on internal factors, i.e. many external factors such as operational environment are not taken account.

3.2 Theoretical hypothesis

The key question addressed in this dissertation is: How do tangible and intangible resources of the diversified farm affect the economic performance of that farm? The actual research questions are formulated as:

- What kinds of resources do diversified farms possess in general, and to what extent do farms use joint resources?
- Do these possible differences between farms affect their financial success?
- How does knowledge gathering, sharing and processing affect a financial performance?
- How does over-diversification affect the financial success of the farms?

As a conclusion of the literature review and theoretical background in chapters 1 and 2, four hypotheses can be created that explain the success of diversified farm from a resource-based point-of-view.

Theoretical hypothesis I: 'Those diversified farms that have at an adequate amount of resources when compared to their major competitors, perform

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better than those farms that do not have enough resources'

The first two key questions of this research were 'What kind of resources do diversified farms possess in general, and to what extent do farms use joint resources? Do these possible differences between farms affect their financial success?' The first theoretical hypothesis is related to 'overall resources' in the theoretical framework. The proposition is drawn from the very basic assumptions of RBT; i.e. for part of the time some firms may possess valuable resources that enable them to develop and implement strategies more successfully than their competitors (resource heterogeneity) and these resource differences may be continuous (resource immobility) (Barney and Arikan 2005). Diversified farms are not exempt they need enough rent generating resources (Peteraf and Barney 2003, Bowman and Ambrosini 2007) to be successful. As diversified farms can operate in a number of industries, it can be argued that it might be difficult to define 'generally valuable resources' for such a heterogeneous group. On the other hand, the common denominator is that all diversified farms operate in agriculture, thus they share at least some joint characteristics. In addition, they can generally be classified as rural micro businesses. According to the empirical results of Galbreath and Galvin (2008), a firm's resources explain more about that firm's success than the industrial structure it operates in.

Theoretical hypothesis II: 'Joint resources may be the way that a diversified farm gains needed resources, and thus helps it to be more successful'

As stated above, there was an additional question to the first key question concerning joint resources '… and to what extent do farms use joint resources?' This proposition is linked with the overall resources of the theoretical framework. The explanation was obtained from strategic management literature and empirical findings from studies that were linked to resources used by diversified farms. For instance, Bergh (2005) states that RBT can provide explanations for reasons why firms diversify *inter alia* by utilizing surplus of capacity. The relationship between performance and chosen diversification strategy with the theory explains how resources that are associated within certain diversification types are related to performance. The results of Pascotto (2006) and Alsos and Carter (2006) indicate that the joint use of resources might strengthen the success of the diversified farm.

Theoretical hypothesis III: 'Those diversified farms that gather, share and process information efficiently in their decision-making are more successful than the others'

The third key research question was 'How does knowledge gathering, sharing and processing affect the farm's performance?' It is linked with the internal and external information and decision-making issues in the theoretical framework. According to numerous studies (Errington 1986, Clemen 1996, Harrison and Leitch 2005) knowledge gathering, sharing and processing are very important factors in the decision-making process. Thus, it can be argued that efficient learning gives a sounder footing for making better decisions, i.e. learning and knowledge have indirect affects on success. Alternatively knowledge can be viewed as an important strategic resource. For example, Paiva et al. (2008) state that organisational knowledge has a central role in developing manufacturing in the direction where it is more integrated with other areas of the enterprise. In this way it creates sustainable competitive advantages and thus a basis for the farm to be more successful.

Theoretical hypothesis IV: *Over-diversification might affect the farm's success negatively; 'over-diversified farms are less successful than their non-diversified counterparts'*.

Finally, the fourth key question of the study was formulated as 'how over-diversification affects the financial success of the farms?' This question is linked to the optimal level of diversification within the framework. According to Markides (1995) *over-diversification* refers to the situation, when a firm diversifies beyond its optimal limit. Hence, diversification starts to have negative effects on profitability and a farm's market value. Rantamäki-Lahtinen (2004) found that a large proportion of Finnish diversified farms had problems with over-diversification. As most of the farms are small businesses where, the firm's market value is generally less important than profitability, thus profitability is the primary focus.

4 Data and methods

4.1 Data

Two data-sets were utilised in this study. First data were collected by a postal survey in 2001. Second data were collected in a follow-up survey in 2006. The 2006 data in turn comprises two data-sets: panel data from the 2001 survey and an additional sample (Fig. 4.1). The data collected for this study were part of a larger research undertaking. The larger dataset consisted of three main groups: 1) non-agricultural small-scale businesses (non-farm enterprises), 2) farmers who also had non-agricultural business (diversified farms), and 3) conventional farmers concentrating only on agriculture (conventional farms).

In this dissertation only the data of group 2) diversified farms are analysed. The results concerning the comparisons between different groups are published elsewhere (Rantamäki-Lahtinen et al. 2007). Similarly, only those variables that are relevant to this study are described. Most of the analysis relies more on the data collected in 2006 (Table 4.1). This is because the data of 2001 did not include as many variables regarding resources as in the 2006 questionnaire. However, 2001 data are used wherever possible.

4.1.1 2001 data collection (N = 663)

The data were collected by postal survey in the spring of 2001. The data collected for this study were part of a larger research project 'Economic and social change on Finnish farms -from agricultural production to small-scale entrepreneurship'. The questionnaire used in 2001 contained 71 questions or series of questions organized under the following headings: background information about the respondent; identity; economic information about the firm/farm; conceptions about being an entrepreneur; principles related to entrepreneurship and customer relations. For the diversified farms there were 12 additional questions related to agriculture. The variables collected and analysed in 2001 for this study are presented in Appendix 1.

A sample of 2,100 diversified farms was selected from the population of the diversified farms of the agricultural census 2000 (Fig. 4.2). The sample farms covered 11 different industries[6]. There were

6 Food-processing, wood processing, handicraft, energy production, metal industry, trade of products that are produced on the farm, tourism, contracting, health and social work, transport and fur farming.

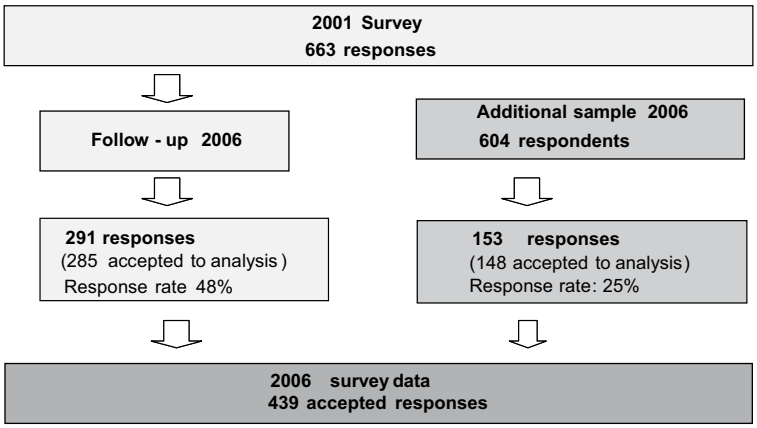

Fig. 4.1 The data collection procedure.

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Table 4.1 How data from different years have been used in analysis.

Research objective/hypothesis (chapter number)	2001 data	2006 data	panel data
Creation of success variables and success groups (5.1)	X	X	
Measuring relationship of overall resources success (5.2)		X	
Measuring the effect of joint resources (5.3)		X	
Learning and knowledge management (5.4)	X	X	X
Over-diversification (5.5)	X	X	X

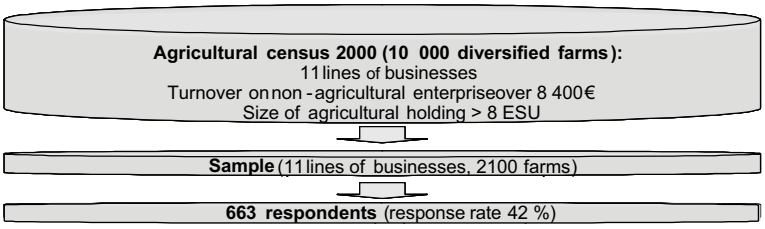

Fig. 4.2 The sample selection and the response rate of the 2001 data.

several limiting inclusion criteria for the farms that were selected for the sample. It was required that the turnover of the non-agricultural activity was more than 8400 €. The minimum level of the size of the agricultural holding was 8 European size units (ESU). These limitations were made for the purposes of the aforementioned larger research project. In that study, three different enterprise groups (conventional farms, diversified farms and non-farm enterprises) were compared, and also similar enterprises were compared. In addition, there was a need to ensure that the samples covered only active enterprises. In the business register definitions 2001, it was the rule that a firm should have a turnover over 50 000 FIM (8400 €) in order to be registered as an active firm. On the other hand, 8 ESUS was the lower limit of the agricultural holdings to be evaluated as an active farm in Finland. Furthermore, 8 ESUs is equivalent to a farm that has four cows and seven ha of forage or to a farm that has 21 ha of barley. The comparison of the sample compared to the total population of diversified farms is in chapter 4.3, in which reliability and validity of the study are discussed.

The response rate of the survey was 42 per cent. The analysis of loss was done according to the known background variables (farm size, production line, location) and there were no differences between respondents and non-respondents.

4.1.2 2006 data collection (N = 439)

The 2006 data were collected in the autumn of 2006. This data collection was also part of a larger survey funded by the Ministry of Agriculture and Forestry. The questionnaire used in 2006 was a modified version of the 2001 questionnaire. Some of the original questions had been excluded and three new themes were added. However, many of the questions were the same as those in the 2001 questionnaire. The new themes were: specific resources, the subjective view of the firm success, use of joint resources and the means of information transmission. Many of the new questions were related to the use of resources. The 2006 dataset has a major role in this dissertation. The variables collected and analysed in 2006 for this study are presented in Appendix 2.

The total number the respondents was 439 (Table 4.2), which actually comprises two datasets: panel data from the 2001 survey (n = 291) and an additional sample (n = 148). Most of the results are shown in the way that all responses are presented as a single group, only some analyses regarding over-diversification is made using only the panel data.

The analysis of loss was also done for this data according to the known background variables; farm size, production line, and location in both datasets. In addition, analyses of sales, personnel and respondent's age were carried out using the panel data. There were no statistically significant differences between respondents and non-respondents.

Panel data

The survey was sent to all 663 diversified farms that had been in the 2001 survey. A total of 15 questionnaires were returned, because the addresses of the 2001 respondents had changed and the post returned the mail (9 respondents), or because the respondent had died (6 respondents). Thus, 648 respondents actually received the questionnaire and of these 330 answered. In six answers there were so much missing data, or the respondent had just used only one option throughout the whole questionnaire, they were rejected and not used further in the analyses.

Situations change during a five-year period. Previously 27 diversified farms had specialised in agriculture and 18 in non-farm business. These farms were excluded from analysis of the diversified farms in the 2006 data. On the other hand, some previously conventional farms had diversified their activities. In one case, an originally non-farm enterprise had included agriculture into its business portfolio and, consequently was subsequently classified as a diversified farm (Table 4.3). Such farms were included in the data for analysis in the 2006 data. Thus, the total number of diversified farms in the panel data was 291. Special attention was paid to those diversified farms that had specialised in agriculture or alternatively to non-farm business. These are covered in the chapter in which over-diversification is discussed.

The additional sample

It was presumed that not all respondents would respond to the follow-up survey. Consequently, an additional sample was taken. The additional sample was obtained from a set of diversified farms from a Farm Structure Survey (sample of 35 000 farms). Of these, 12 400 of these farms were diversified, and a sample comprising 600 diversified farms was drawn from this group. One postal address to which questionnaire was sent was wrong and the post returned the questionnaire. Thus, 599 firms received the questionnaire and 153 responded. In seven answers there were so much missing data, or the respondent had just used only one option throughout the whole questionnaire, that they were rejected and not used further in the analysis.

A total of 10 farms that had been diversified in 2001 had specialised solely into agricultural enterprises by 2006, whereas six had specialised into non-farm businesses, and thus were no longer considered as diversified farms. These 'farms' were also excluded from the analysis of the diversified farms. On the other hand, 10 previously conventional farms had since diversified, and in two cases had formerly belonged to the non-farm enterprise sample. These farms were also included into the dataset for analysis. Thus, the total number of diversified farms in the additional sample was 148 (Table 4.4).

Table 4.2 Responses from different samples 2006.

Panel data, responses	Additional samples, responses	Total
291	148	439

4.1.3 Data description

Background information about the respondents

Most of the respondents were men in both datasets (Table 4.5). As one would expect, the respondents were naturally older in the 2006 follow-up sample and they also had more entrepreneurial experience than they did in 2001. In the additional sample of

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Table 4.3 The transfers between groups 2001–2006, panel data. Underlined numbers mean the 2006 population of diversified farms.

Group	Non-farm enterprise 2006	Diversified farm 2006	Conventional farm 2006	Total
Non-farm enterprise 2001	66	1	0	67
Diversified farm 2001	18	285	27	330
Conventional farm 2001	0	5	131	136
Total	84	291	158	533

Table 4.4 The collected data from the additional sample. Underlined data refer to the 2006 population of diversified farms.

Group	Non-farm enterprise 2006	Diversified farm 2006	Conventional farm 2006	Total
Non-farm enterprise sample	60	6	0	66
Diversified farm sample	2	134	10	146
Conventional farm sample	0	8	133	143
Total	62	148	143	353

Table 4.5 Background information about respondents.

Group	Total 2001	Follow-up 2006	Additional 2006	Total 2006
Respondent's age (mean)	46	52	47	50
Sex (male:female ratio)	85:15	87:13	88:12	87.5:12.5
Years of experience as entrepreneur (mean)	17	22	19	21
University level (%)	6	6	13	8
Further education (%)	19	19	22	20
Vocational professional education (%)	43	44	41	43
Short professional courses (%)	17	18	17	17
No professional education (%)	14	13	8	12

2006, respondents were marginally younger, had slightly less entrepreneurial experience but were better educated than respondents of the 2001 sample. In general, the 2001 and 2006 datasets are fairly similar in terms of respondents' characteristics and it can be assumed that respondents' background factors (age, sex etc.) did not significantly skew the results between survey years. Consequently, differences in the data between the sample years were attributed to real changes, and not to sampling variation.

Background information about the farming

Next, the agricultural production systems of the farms are described. The average farm size is similar in both data sets, although it can be seen that respondents from additional sample tend to have slightly larger farms (Table 4.6). On the other hand, the respondents of slightly smaller farms had answered the follow-up survey, so in general both total datasets are quite similar in their structure. Most farms in the data produce arable crops, the situation is quite similar to that for Finnish diversified farms in general (Mustalahti and Rantamäki-Lahtinen 2006). Thus, data represents the total population of diversified farms quite well in this respect.

Background information about the non-farm lines of business

Most diversified farms in this study operate in industry or services sectors (Table 4.7). The original sample (dataset 2001) was selected on basis of the type of industry. There were 11 different lines of businesses, and many of them were in the industrial sector. This can be seen in the distribution of the categories of industries in the 2001 data and the 2006 panel data. These do not represent the whole population of diversified farms. On the other hand, the additional sample in 2006 represents the situation of the whole population quite well. Farms were included into the sample by using the random sampling method and the distribution between different main lines of industries is very similar to that of the whole population of diversified farms for which the service sector is dominant (Mustalahti and Rantamäki-Lahtinen 2006, and Table 1.1 in chapter 1). There are also other limitations. The sample was selected from the farms in which the turnover of diversification activity was over 8400 Euros in 2000 and 10 000 euros in 2005. Therefore the sample structure is not entirely representative of the whole population of diversified farms. Consequently, one has to take care when making generalisations when interpreting these data.

Background information about the diversified farm entities

The variation between the diversified farms for the foundation years was great. In the 2006 data, some of the respondents had started their business (agriculture or other) as early as the 1950's, whereas others had only started during the survey year. In over 89 per cent of the cases the entrepreneur had taken over a family business i.e. the family farm. In 194 cases the respondents had clearly indicated they had a portfolio of several businesses. Yet others were classified as being more 'diversified firm' types, i.e. they had several business entries within the same firm.

The mean time between starting an enterprise in the first industrial sector and another enterprise in the second industrial sector was 11 years. However,

Table 4.6 Basic information about farming.

Group	Total 2001	Follow-up 2006	Additional 2006	Total 2006
Arable land (mean), ha	38	33	52	39
The share of agriculture from the family's net income, %	44	42	49	44
Main production line; Animal husbandry/crop production	38/62	40/60	45/55	42/58
Turnover of agriculture, average from the year the survey was conducted, €	65 200 (group mean)	81 005	112 530	82 900
Farm labour (including the farm family), man-years	1.38 (group mean)	1.09	1.47	1.23
Investments into agriculture mean from the year the survey was conducted, €	18 700 (group mean)	24 600	39 500	30 500
What percentage had made an investment of more than 8 400 € to agriculture during the survey-year	49	38	57	43

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as might be expected the sequence varied a lot. One-third of respondents had started an enterprise in the second industrial sector within five years of starting the first enterprise in the first sector. On the other hand, one out of ten had started/taken-over their second industrial sector enterprise more than 24 years after acquiring the first one.

Most of the diversified farms in the data were micro-firms and they employed approximately 4 man-years (Table 4.8). In the 2001 data 94 per cent employed less than 10 man-years and 44 per cent less than 2 man-years. In 2006 data 96 per cent of the farms employed less than 10 man-years and 48 per cent less than 2 man-years. The average total sales (agriculture, subsidies and other activities sales included) in 2001 was approximately 220 400 euros, and the range was from 4000 euros to 2.5 million euros. For the 2006 data, the total sales average was 234 200 and varied from 4000 to 5 million euros. Most of the farms were family businesses in the 2001 data approximately 60 per cent and on 2006 data 66 per cent either spouse and/or other family members were involved running the business.

Table 4.7 Basic information about non-farm lines of businesses.

Group	Total 2001	Follow-up 2006	Additional 2006	Total 2006
Main lines of business (%)				
- Primary production*	10	12	11	12
- Industry	46	44	17	35
- Trade	9	11	7	9
- Services	35	34	66	44
Turnover of other businesses than agriculture, average from the year when the survey was conducted, €	162 500 (group mean)	178 600	89 300	144 500
Personnel man-years	2.66 (group mean)	3.12	1.69	2.58
Investments in other businesses than agriculture mean from the year when survey was conducted, €	27 500 (group mean)	24 100	40 900	30 900
The percentage of investments exceeding 8 400 € to other business than agriculture during the survey-year	54	42	33	38

* Other than agriculture and forestry

Table 4.8 Basic information about the businesses in the surveys.

Variable	Total 2001	Follow-up 2006	Additional 2006	Total 2006
How many years respondent had run this enterprise (the first still existing enterprise)	17	22	18	21
The share of the family's net income from the enterprise	83	76	75	76
Sales, (subsidies included) €	220 400 (group mean)	256 200	198 400	234 400
Personnel, man-years	4 (group mean)	4.1	3.1	3.8
Investments means for the year the survey was conducted, €	44 700 (group mean)	50 100	79 400	61 700
What percentage had made investment more than 8 400 € during the survey-year	64	60	75	65

Table 4.9 The classification of data according to the share of agriculture as a proportion of total 'measured output' (Rantamäki-Lahtinen et al. 2007).

Group	Total 2001	Total 2006
Proportion of agriculture higher than other business	204	143
Proportion of agriculture equal to other business	208	145
Proportion of agriculture lower than other business	240	145

Diversified farms are not a homogenous group at all. Their farming varies, in that there are big and small farms, different production lines etc. Moreover, their non-farm businesses varied according to: the line of business enterprise, size and other characteristics. Thus, both datasets were divided by using information on firm sales, farm sales and personnel into three groups. These groups were: group (1) where the share of agriculture is higher than non-farm business for the total output, group (2) where the share of agriculture is approximately equal to other business for the total output, and group (3) where the share of agriculture is lower than other business when the total output is taken account. These categories were created to analyse data for another study (Rantamäki-Lahtinen et al. 2007). However, these classifications are also very useful when the result of this study are presented and discussed. Therefore they are also utilised in this dissertation. The classification is illustrated (Table 4.9), and it can be seen that in both sets of data all groups are about equal in size.

4.2 Methods

Data were analysed using statistical quantitative methods. These methods were mainly: basic multivariate data analyses, correlations and path analyses. In addition, basic comparative methods (Variance analysis, Kruskall-Wallis non-parametric test, χ^2 test) were used to test differences between different groups. The methods for a particular analysis are described in more detail in the results chapter. However, a brief general overview of used multivariate techniques and path analysis are presented in this chapter. In Table 4.10 the more advanced methods that were used for a particular task are shown. In addition, correlations and basic comparative methods are used in calculating nearly all of the data.

Factor analysis

Factor analysis is actually a group of multivariate statistical methods whose primary purpose is to define underlying structures in a data matrix. Research problems and objectives are addressed by analysing the structure of the relationships (correlations) among a number of variables by defining common underlying factors. The primary uses of factor analysis are summarisation and data reduction (Hair 1998). Factor analysis can be used in two alternative ways. First, it can be seen as an *explorative* technique to investigate relationships between variables and factors without making any prior assumptions about which variables are related to which factors. Second, factor analysis can be a *confirmatory* technique for testing a specific factor structure (Everitt and Dunn 2001). Data reduction with factor analysis has a number of advantages. It can be helpful during the process of theory development and testing. It might also have a practical application in the situations in which a researcher wants to reduce a large number of variables to a smaller number in other statistical methods. Factor analysis can also be useful for re-examination of existing measures. However, there are also limitations and disadvantages to factor analysis. First, it is only as good as the original variables in the sense that it will not tell which dimensions are missing. It is essential that the creation and selection of the

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Table 4.10 Statistical methods used.

Research objective/hypothesis (chapter number)	Methods
Creation of success variables and success groups (5.1)	k-means cluster analysis, confirmatory factor analysis, principal components analysis
Measuring relationship of overall resources success (5.2)	confirmatory factor analysis, path analysis,
Measuring the effect of joint resources (5.3)	k-means cluster analysis
Learning and knowledge management (5.4)	exploratory factor analysis
Over-diversification (5.5)	k-means cluster analysis, discriminant analysis

variables are based on prior theoretical considerations and/or research results (Warner 2008). Second, factor analysis has been criticized for being too subjective. Nonetheless, it can be seen as a useful tool for investigating the particular structural features of multivariate observations (Everitt and Dunn 2001). In this research both explorative and confirmatory factor analyses are used.

Cluster analysis and discriminant analysis

The idea behind cluster analysis is to get the simplest structures that still represent the homogenous groupings (Hair 1998). Non-hierarchal k-means is a cluster procedure, which is used in this type of research. This procedure attempts to identify relatively homogeneous groups of cases based on selected characteristics, using an algorithm that can handle large numbers of cases. However, the algorithm requires that the researcher specifies the number of clusters (SPSS user guide 2007), and in practice it is best to compute different cluster solutions and then decide among the alternative solution using *a priori* criteria, practical judgement, common sense and/or theoretical foundations (Hair 1998). Cluster analysis has turned out to be useful technique for the exploratory approach for analysing complex multivariate datasets. However, one needs to be cautious, and misleading solutions should be avoided because cluster analysis is often the starting point for other analyses (Everitt and Dunn 2001).

Discriminant analysis is an appropriate statistical technique to use when the dependent variable is categorical and independent variables are metric. Discriminant analysis involves deriving the linear combination of two or more independent variables that will discriminate *a priori* defined groups (Hair 1998). The analysis also gives information about the amount of weight given by each predictor variable (Warner 2008). In this research the discriminant analysis is used to evaluate the results of cluster analysis. The same variables that were the bases of clustering were used as independent variables in discriminant analysis to confirm the number of clusters and also to verify the cases classification. Similar testing of results of cluster analysis or other pre-defined groups by using discriminant analysis is commonly used (Nummenmaa 1997, Davies et al. 1998, Pollalis 2003, Forsman 2004).

Path analysis

One way to analyse a predicted causal relationships between variables is to use path analysis, which is a specialised version of the structural equations model (SEM) method. According to Shipley (2002), the SEM models concentrate on patterns of covariances and minimises the differences between the observed and predicted patterns of covariations. The basic steps are first the hypothesised causal structure is specified. In the second step, a causal model is translated into an observational model. In the observational model it is also specified which parameters are estimated forms of data (i.e. are free) and which are fixed. The third step of the analysis is to derive the predicted variance and covariance between each pair of variables by using covariance algebra. The fourth step estimates free

parameters using the maximum likelihood (or other methods). The final step is to calculate the probability of having observed the minimum difference between the observed and predicted covariances. If the probability is small ($p < 0.05$), then it can be concluded that observed data are not calculated and not generated by the causal process hypothesised. Thus the model will reject the hypothesis (Shipley 2002). The primary components of path analysis are the path diagram and the estimation of path coefficients (Everitt and Dunn 2001). The significant advantage of path analysis is that it allows the analysis of causal relationships and *a priori* test a set theoretical model. Models should be kept simple, because complicated models are difficult to estimate and interpret and might have a substantial number of error outcomes (Nummenmaa 1997).

Methods such as structural equation models and path analysis have developed quickly. Their use has increased rapidly during the past few years. However, these models have also disadvantages. They should be interpreted cautiously and one should remember that even if the model fits, it is only one of the possibilities. There might be an alternative model that fits better, or some variable that is really important for analysing the causal relationship might be missing (Nummenmaa 1997, Everitt and Dunn 2001).

4.3 Reliability and validity of the study

Reliability

The reliability of the measure or the study means that results are not random (Hirsjärvi et al. 2000). A good measurement yields consistent results and low reliability implies that scores contain large measurement errors (Warner 2008). There are several ways to explore reliability. First, if two different studies have similar outcomes, the result is reliable. A phenomenon can be investigated more than one time, and if the result holds the outcome of these variables is reliable. There are also some statistical measures that can help to evaluate the reliability of these variables (Hirsjärvi et al. 2000). Comparisons of results with other studies are presented in chapter 6 in which the results are discussed, but generally the findings are in line with the theory and other studies.

In addition, the reliability of study data was increased by other ways. There were two different data-sets (one from 2001 and one from 2006), and the earlier questionnaire had a partly different set of questions. Nonetheless, the variables related to resources, information gathering, sharing and processing were in practice cross sectional data from 2006. The reliability of these themes was increased by using the measures that were tested and used in the other studies. For example, the variables concerning resources that followed the questions and results of Forsman (2004) and also the variable that followed numerous findings that entrepreneurs learn especially by actual experience include the process of 'trial and error' (Cope 2005). The theme that was linked to the over-diversification phenomenon could be tested by using the panel data. Similar k-means cluster analysis was done on both the 2001 and 2006 datasets. Very similar cluster solutions were obtained and the differences between the compared groups were similar. Summed scales (later in the text referred as '*sum variables'*) combine several variables, to measure the same concept as a single variable. Such a procedure increases the reliability of the measurements (Hair et al. 1998) and therefore this method was used in this study. Finally, when individual variables were chosen for analysis the reliability measure, 'Cronbach's Alpha' was used (Hair 1998). The reliabilities of each confirmatory measurement model (confirmatory factor analysis) are discussed in the results chapter. In addition, to the use of Cronbach's Alpha, two additional measures, namely the *composite reliability* (ρ_c) and *average variance extracted* (ρ_a), were calculated for each latent variable in order to evaluate the reliability of individual indicators of confirmatory factor analysis. The former is calculated from formula 1 and indicates how well a set of latent variables is a reliable measurement of the construct. Values equal or greater than 0.6 are desirable (Diamantopoulos and Siguaw 2000).

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$\rho_v=(\Sigma\lambda)^2/[(\Sigma\lambda)^2+\Sigma(\theta)]$ (formula 1)

ρ_c = composite reliability
λ = indicator loadings
θ = indicator error variances

Inthe latter metric, the average variance extracted is complementary to composite reliability. It shows the ratio between variance that has been captured by the construct compared to the variance due to measurement error. The measurement is calculated from formula 2, and the values equal or greater to 0.5 are desirable (Diamantopoulos and Siguaw 2000).

$\rho_v=(\Sigma\lambda)^2/[\Sigma\lambda^2+\Sigma(\theta)]$ (formula 2)

ρ_v = average variance extracted
λ = indicator loadings
θ = indicator error variances

Based on all these considerations, the reliabilities of the findings in this study are reasonably high. Therefore the results are not just coincidence. The reliability of individual indicators and the empirical findings are presented in the results and conclusions chapter.

Validity

Validity means that the variable or research method measures the thing that it is intended to measure. For instance, there is a risk that in postal surveys the researcher and respondents understand the question differently (Hirsjärvi et al. 2000). According to Gibbert (2006a) there are three different forms of validity:

1) *internal validity;* which refer to the extent to which there is a causal relationship between variables
2) *construct validity;* which refers to the extent to which a study investigates what it claims to investigate
3) *external validity,* which refers to the general nature and applicability of obtained results to the whole population

External validity builds on the two other validity types. Without a clear theoretical or causal logic or link between the theory and empirical observations, generalisations can not be made (Gibbert 2006a). Internal validity is normally higher in studies in which different experimental factors can be controlled than in non-experimental studies (Warner 2008), but it still has to be evaluated on non-experimental studies as well.

There are some points than can be used for evaluating the internal validity. These include measures that are aimed at correlating with each other. In practice, there are several variables to measure the same quantity and there is correlation between independent and dependent variables (Nummenmaa 1997). The internal validity of this study is at a reasonable level. Several variables were used to measure same thing, and these measured dependent and independent variables correlated with each other. Furthermore, the relationships were measured from different points-of-view. For instance, the causal relationships between sum variables were evaluated by using path analysis and correlations. Moreover, the sum variables were tested between the success groups. For success determinations there were two different kinds of parameters used: a sum variable that measured the respondents subjective evaluation of the success in defined economic objectives, and more objective parameters of success that were based on quantitative factors such as profitability.

As stated above, construct validity refers to the theory and ideas of the study are in line with the existing empirical data, i.e. the variables really measure what researcher intents them to measure. The construct validity of the used variables in this study was determined by several approaches. First, variables and items in the questionnaires were based on the theories adapted in this study and also results of previous studies that were conducted in the same research area. Second, both the questionnaires (2001 and 2006) were preliminary carefully tested on diversified farmers and other entrepreneurs that were the target research group. Several of these

diversified farmers answered the 'test versions' of the questionnaire and were interviewed afterwards. This was done by ensuring that the questions were at a language level that respondents understood easily. The author's earlier quantitative studies (Rantamäki-Lahtinen 2000, Rantamäki-Lahtinen 2002, Rantamäki-Lahtinen 2004) and especially interviews conducted in 2003 for the purpose cross-cultural qualitative study (Rantamäki-Lahtinen et al. 2005, Rantamäki-Lahtinen 2007) were a great help in this respect. In addition, both questionnaires were scrutinized and commented upon by practitioners and academics in the same or similar research field. Their comments were used to enhance the suitability of the questionnaires significantly. The operational measures of the theoretical constructs and validity of individual variables are discussed in chapter 5 where the data are presented.

The external validity of this study had to be evaluated critically. A selectivity bias means that a sample has not been drawn randomly from the population (Hsiao 2003). Although the sample size was fairly large, the research design relating to the 2001 dataset used lower limits for the sales limit, thus affecting the extent to which these study data could be generalised. For example, farms in this study represent different business enterprises and bigger sales volumes when compared to that of the whole Finnish diversified farm population. In addition, the response rate was modest, although it was similar to other studies in the field (Rantamäki-Lahtinen 2000, Forsman 2004). The analysis of loss did not reveal any significant differences between non-response and response groups in respect of the background variables. However, it is still possible that non-respondents might tend to be less successful than respondents. Due to the restrictions mentioned above and subjective nature of used multivariate analysis methods, the results of the study cannot be generalised and applied *as such* to the whole population of Finnish diversified farms. However, it can be assumed that results of the study, such as the effect of general resources to success and problems caused by over-diversification, do exist in real-life.

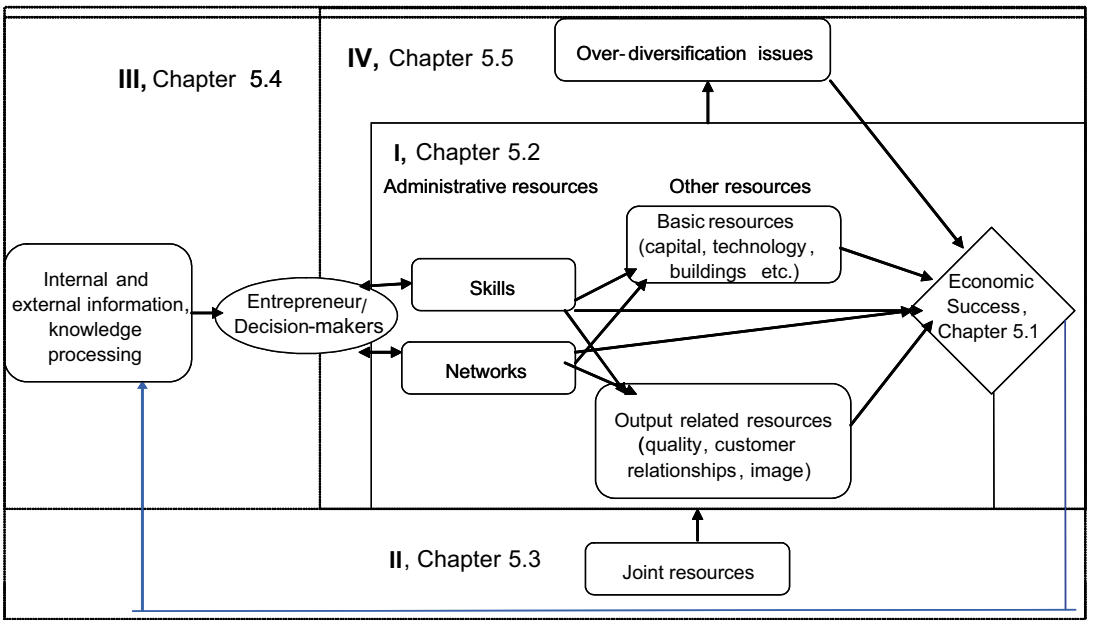

Fig. 4.3 The operational framework of the study.

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4.4 Operational framework

The operational measures of the theoretical constructs and validity of individual variables is discussed further in chapter 5 where their results are presented. The operational framework and also the explanations of which propositions are linked with different parts of the theoretical framework are shown (Fig. 4.3). The term economic success is described in detail and success indicators are discussed under heading 5.1, whereas the assessment of link between overall resources and success is presented in section 5.2. Moreover, section 5.3 discusses the overall resources, as a causal relationship between the use of joint resources and general resources. Knowledge gathering, sharing and processing and their link to decision-making and correlation with success are discussed in section 5.4. The effect of over-diversification to the success and also the link between resources and over-diversification are dealt with under heading 5.5. Finally, the conclusions and discussion of the results are presented in chapter 6. A competitive advantage is defined as a situation in which a farm is able to create more economic value than its break-even rivals (Peteraf and Barney 2003). In this dissertation, competitive advantage is not measured directly, but it is determined through economic success. However, resources possessed by the farm were measured relative to those of the farm businesses' main rivals. In addition there were few variables that measure a farm's capability to compete in different types of competition. These results are presented on chapter 5.2.

5 Results

In this chapter four theoretical propositions that were discussed in chapter 3 are tested using empirical data. The chapter is outlined as follows; in section 5.1 how indicators of success were created is discussed. Under headings 5.2 and 5.3 the effects of possessing general resources and the use of joint resources are presented (*hypothesis 1 and 2*). In section 5.4, the use of success of the firm is tested from the learning enterprise point-of-view (*hypothesis 3*) and under heading 5.5 the over-diversification phenomenon is described (*hypothesis 4*). A summarised overview of results is presented on conclusions and discussion of this chapter.

5.1 Determination of success variables in this study

A firm's success can be understood in many alternative ways. In this particular research, success is studied from the point-of-view of the whole business activity of the diversified farm (the farm and non-farm business jointly) as it is has been argued that overall business performance should be assessed at the level of the entrepreneur, rather than the level of the single firm/enterprise (Rosa and Scott 1999). In addition, success is a multidimensional phenomenon, i.e. a firm might be successful for one performance dimension and unsuccessful for another. In order to understand this multidimensional nature, it is important to apply a multidimensional set of measures instead of just one measure (Lumpkin and Dess 1996, Forsman 2004, Madsen 2007). For the purposes of this study, the term multidimensional means financial success is measured by using multiple indicators. Other forms of success such as: survival or perceived success have not been taken into account.

According to Grant (1991), Peteraf (1993) and Perry et al. (2005) one of the objectives of resource-based theory is to link the use of resources to a firm's success, so success can be understood as long term economic profit/performance and/or sustainable competitive advantage. In this study, the former is examined. Thus, in this study suc-

cess is measured through economic success indicators. Two different kinds of variables are utilised in 2006 data. The first variable is more subjective in its nature, but it might be more informative about long term success and fits better into the theoretical perspective. Unfortunately it concerns only 2006 data, because the same or even similar variables were not collected in the 2001 survey. The second set of variables can perhaps be viewed as being more objective, though it provides more or less short-term information about success. Similar financial success measures have been used earlier by Olson et al. (2003) and Kilkenny et al. (1999). Very similar indicators were created in the 2001 data. All of these used success indicators are presented in this chapter.

5.1.1 The success sum variables for 2006 and dividing farms to success groups

In the 2006 questionnaire there were three subjective questions linked to the economic profit and profitability and four more objective questions about profits and profitability during the mid 2000's. Subjective questions were formulated as: How successful have you been achieving the following principal objectives of your entrepreneurial activities?' Among a list of different principals, there were three questions related to the economic profit. These questions were:

1) Profit maximising
2) Achieving a better standard of living for me and my family
3) Economic profitability of the entrepreneurial functions.

The respondents evaluated their success in these matters on Likert type scale scoring from 1 to 5 (1 = not at all, 5 = very well).

Questions, that directly covered financial information in more detail in 2006 questionnaire can be thus evaluated as being different, or more objective in nature were formulated as follows:

1) Net profit 2003, on a scale of 1 to 5, where 1 is 'notably unprofitable' and 5 is 'satisfyingly positive
2) Net profit 2006, on same scale as the previous question
3) The development of profitability 2002 to 2005, on a scale 1 to 5, where 1 denote that profitability has significantly weakened and 5 that profitability has been significantly enhanced.
4) Relative profitability compared to enterprises in the same sector, on a scale 1 to 5 where 1 means that the profitability is significantly weaker and 5 that profitability is significantly better.

Most of the respondents felt that they have had at least moderate success as measured by some indicators (Fig. 5.1 and Table 5.1).

In this part of the study, it was important to determine the appropriate measures of success. Based on *a priori* theoretical considerations, two different dimensions of financial success can be determined from these data. The success indicators will largely affect the other parts of the study data, so it was decided that this hypothesis was tested by confirmatory factor analysis. Different variables were tested for whether they were measuring a single uni-dimensional latent variable (Jöreskog 2005), and if they were summed up as a sum variable. The confirmatory factor analysis (CFA) is considered a useful method for the measurement of specific constructs (Hair 1998).

The seven success indicators previously mentioned were chosen for the analysis. There were 381 cases that contained all the responses. The first step was to check whether they were suitable for analysis. One of the basic assumptions of confirmatory factor analysis is that the data have bivariate normality. However, when ordinal variables are used, the assumption of an underlining bivariate normality needs to be calculated for a polychoric correlation. According to Jöreskog (2005) polychoric correlations are very discerning in detecting violations of underling biovariate normality. Jöreskog (2005) developed an RMSEA test ratio (similar to RMSEA that measures goodness of fit

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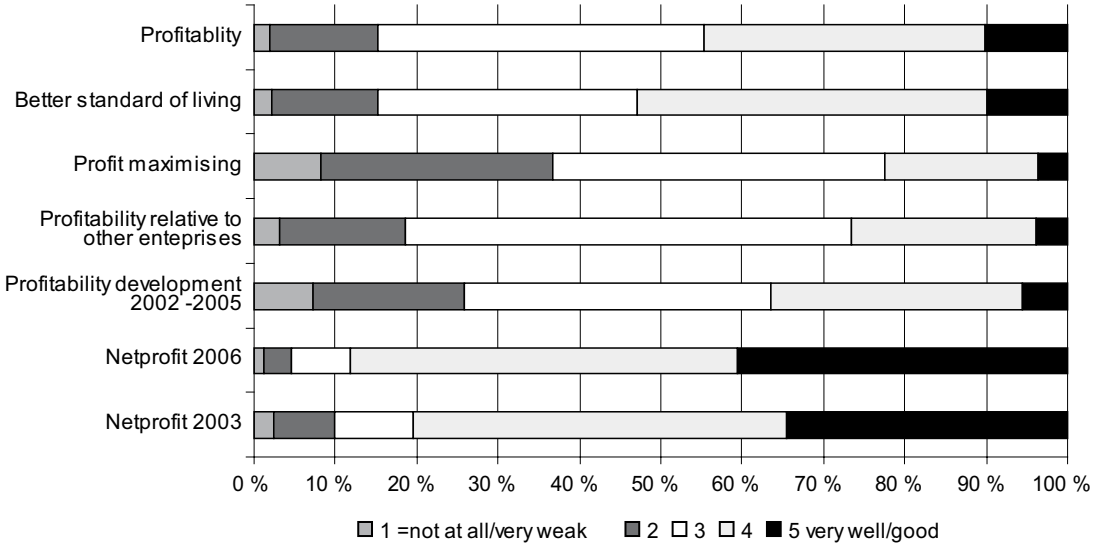

Fig. 5.1 Responses to the financial success questions in the 2006 questionnaire (n = 395).

Table 5.1 Descriptive statistics.

Variable	N*	Minimum	Maximum	Mean	Std. Deviation
Profit maximising	395	1	5	2.8	0.95
Better standard of living	394	1	5	3.5	0.92
Economic profitability	393	1	5	3.4	0.91
Net profit for 2003	385	1	5	4.0	0.98
Net profit for 2006	391	1	5	4.2	0.82
Profitability development 2002–2005	391	1	5	3.1	1.00
Profitability relative to other enterprises on the same sector	390	1	5	3.1	0.81

* N varies between variables, as statistics have been calculated for each individual variable, missing cases are not deleted list wise.

for SEM models) to measure non-central χ^2 distributions. If the RMSEA ratio is smaller than 0.1 (p-value for the analysis tests the probability that RMSEA is smaller than 0.1), there are no serious effects of non-bivariate normality and the variables can be used in the analysis from this point-of-view. In Appendix 3 results of the test of such data are presented. All RMSEA values were less than 0.1.

A correlated two-factor model was proposed as a theoretical measurement model (Fig. 5.3). The first dimension 'short term financial success indicators' (success_i) illustrates detailed financial measurement of profits and profitability. The second dimension (success_s) illustrates 'subjective' financial success in the sense that the respondents themselves directly evaluate how successful their businesses have been. The first latent variable (fac-

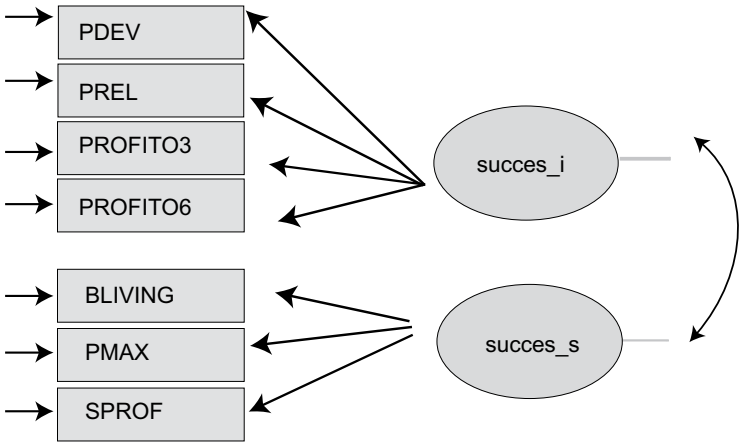

Fig. 5.2 The conceptual diagram.

tor) consist of four x-variables or indicators; profit 2003 (PROFIT03,) profit 2006 (PROFIT06), profitability development 2002–2005 (PDEV) and profitability relatively to others (PREL). The second dimension contains three variables, 'better standard of living' (BLIVING), profit maximization (PMAX) and subjective profitability (SPROF).

Confirmatory factor analysis was conduced by using the 381 responses (Appendix 3). The original variables were standardised by setting the mean to 0 and standard deviation as 1 (Ranta et al. 2002). The analysis was made by using the Prelis and the LISREL programs. A conventional covariance matrix was selected for this analysis[7]. The confirmatory factor analysis model was fitted to the data and the null hypothesis stated as:

H_0 = *estimated model is correct*
H_1 = *estimated model is not correct*

The null hypothesis is often tested with the Pearson's χ^2 test, and other statistical significance tests, to assess whether the produced variance covariance matrix deviates form the observed (Warner 2008). If *p*-values are small ($p < 0.05$) and the χ^2 values are high the model does not fit the data. If *p*-values are big ($p > 0.05$) they indicate that the actual and predicted input matrixes are NOT statistically different (Hair 1998). After running the confirmatory factor analysis, it was found that the data did fit the theoretically predicted model. Moreover, χ^2 was 21.32, df were 13 and $p = 0.067$. Therefore H_0 was not rejected, and the model fitted the data (Fig. 5.3 and Table 5.3).

Individual indicators were also analysed. Models that included negative variances or factor loadings over 1 were not used. Estimates should be sensible from the point-of-view of interpretation. Statistical significance can be measured by using t-test values. If the estimated indicator has t-value lower is than two, it is interpreted as zero, otherwise it is deemed as other than zero. Only indicators that are other than 0 should be incorporated into the model (Nummenmaa 1997). In this analysis, there were no negative variances (Appendix 3) and there were no factor loadings over 1 (Table 5.2). All t-values of indicators were over 2, and thus filled the requirement of being statistically significant. Error variances were relatively high for a couple of variables but were still acceptable for this model, and there were no theoretical grounds removing them from the analysis. Therefore, the model is presented as it is.

7 A procedure recommended by Professor Jöreskog on Lisrell models Kataja PhD course spring 2005.

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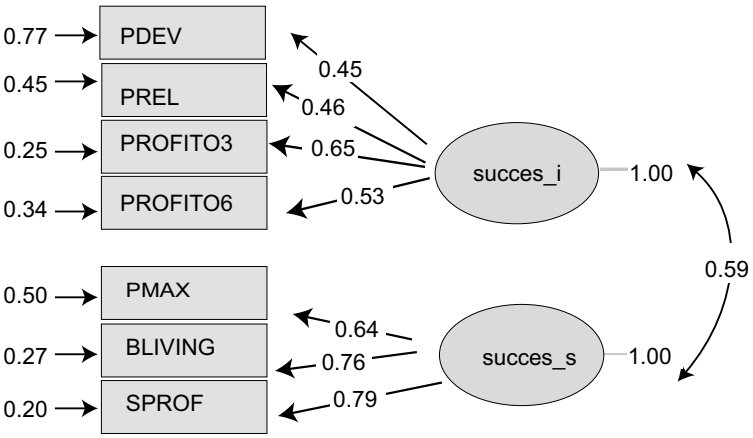

Fig. 5.3 Estimation of the result of the confirmatory factor analysis.

Table 5.2 Results from fitting the model to the data.

Measures	F1, loadings (t-values)	F2, loadings (t-values)	Error variances		R^2
			estimates	t-values	
profit2003	0.65 (19.63)	-	0.25	6.44	0.63
profit2006	0.53 (13.35)	-	0.34	10.54	0.46
profitability development 2002 -2005	0.45 (9.03)	-	0.77	12.88	0.23
Profitability relative to other enterprises on the same sector	0.46 (10.93)	-	0.45	12.16	0.32
profit maximising	-	0.64 (14.17)	0.50	12.14	0.45
better standard of living	-	0.76 (18.40)	0.27	8.26	0.68
Profitability	-	0.79 (19.63)	0.20	6.44	0.75

Table 5.3 Goodness of fit statistics.

Measures	Model	Acceptable level
CFI	0.99	> 0.90
RMSEA	0.040	<0.05

There are some additional methods to assess the degree of 'approximate' fit between data and the model. Shipley (2002) described two methods to evaluate the model fitting the data. One of them is the Root Mean Square Error of Approximation, RMSEA, an average of the residuals between observed and estimated input matrices. Bentler's comparative fit index, CFI, measures how much a proposed model reduces the non-centrality parameter relative to a baseline model. According to

these indicators, this CFA model fits the study data (Table 5.3).

According to the confirmatory factor analysis, these two separate dimensions of economic success existed. Two sum variables were created in order to illustrate these two dimensions. The first sum variable was used mainly in the analysis as it was closer to the financial success term derived from theory, and it also presumed to be more stable. In the short run, there might be a substantial number of volatile changes between the years for the diversified farms. This is because agriculture is dependent on and also subject to natural processes that affect the profit of the enterprise. Cronbach's Alpha (α), composite reliability and complementary measures of average variance extracted were used in order to determine the reliability of the individual indicators. Although a case of low variance extracted was observed for the short term success, the assessment of the measured part did not reveal crucial deficiencies on the whole (Diamantopoulos and Siguaw 2000). Although both were revealed to be good or acceptable evidence of validity and reliability, the reliability measurements for individual constructs were better for the success sum variable. This supports the decision to use success sum variable in the analyses. Thus, the short-term success sum was used as a background variable and test variable between different groups of farms. Sum variables were scored on a 1 to 5 scale then divided by the number of original variables (Hair et al. 1998) to make their interpretation easier. The descriptive statistics and reliability statistics of both the sum variables are presented in Table 5.4. As expected, the created variables correlate with each other. This suggests that though these success sum indicators were measured by different parameters, these variables are related and therefore explains the same broad phenomenon: i.e. financial success.

$$success\ sum = \frac{(profit\ maximising + better\ standard\ of\ living + profitablity)}{3}$$

$$\frac{short\ term\ succes}{2006} = \frac{(profit\ 03 + profi\ 06 + profitability\ development + relative\ profitability)}{4}$$

Defining success groups 2006 data

Cluster analysis a multivariate technique designed to create groups of objects based on their common characteristics. Resulting clusters should exhibit high internal (within-cluster) homogeneity and similarly high external (between-cluster) heterogeneity. Cluster analysis is mainly used as an exploratory method for taxonomy[8] formation, but also as a confirmatory method for comparing proposed typology. Cluster analysis is an appropriate method for this study data. It has an objective methodology for quantifying the structural characteristics of data. It also has a different set of requirements for data than many other techniques. These include requirements for typifying (how representative) the sample and the multicollinearity of data (Hair 1998). On the other hand: normality, linearity and homoscedasticity are not required. In this study data, cluster analysis was used as a method for separating a group of 'less successful' farms from the 'successful farms' and created the empirical classification that was used in the later stages of this study. Hence, the three subjective economic success variables mentioned

8 Taxonomy means an empirically based classification; typology is theoretically based classification (Hair et al. 1995).

Table 5.4 The scale means, standard deviations, reliability measures and correlation matrix.

Constructs	Mean	SD	α	ρ_c	ρ_v	Correlation 1	2
1. Subjective success	3.21	0.80	0.82	0.82	0.61	1.0	
2. Short term success	3.67	0.65	0.64	0.64	0.41	0.4	1.0

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above were chosen for the analysis. The k-means cluster procedure attempts to identify the relatively homogeneous groups of cases based on selected characteristics, using an algorithm that can handle large numbers of cases. However, the algorithm requires that the researcher specifies the number of clusters (SPSS user guide 2007).

In this data, k-means cluster analysis was done by using 2- to 5- group solutions. The 3-group solution provides the clearest analysis theoretically speaking. The final result was easy to interpret and the group sizes were still reasonable, though the medium group was large. However, for the purposes of this study a clear group of 'top farms' and a clear group of 'weakly performing' farms were needed for further analysis. The final outcome is presented in the Table 5.5a. and the descriptive statistics are shown in Table 5.5b. The first cluster (n = 95) describes farms that are relatively successful for all aspects whereas the third cluster (n = 67) describes the farms that are not successful for any measured aspect. The second cluster (n = 230) represents the greatest number of partly successful farms. The groups were named after these characteristics simply as: 1) the best performing group, 2) the intermediate group and 3) the weakest performing group. This created nomenclature is used later in this study. At this point only the differences in personal characteristics (age, education, sex, experience) of the entrepreneur were tested. There were no statistically significant differences on personal characteristics between groups. Therefore any possible differences in performance would be caused by something else. Financial variables did differ between groups, which implies that the validity of the grouping is good. According to other financial indicators, in general farms within the best performing group were bigger in terms of personnel and turnover, and the short-term success sum was higher than for the weakest performing group (Table 5.5).

5.1.2 2001 success indicators

As stated earlier, the same indicators that were used for creating 'success groups' in 2006 were not available in the 2001 data. However, there were similar short-term success indicators to those found in the 2006 survey for the success of diversification activity. Therefore a similar approach was utilised. The questions were formulated as follows:

1) Net profit for 1999, on a scale of 1 to 5, where 1 is 'notably unprofitable' and 5 is 'satisfyingly positive
2) Net profit for 2001, using the same scale as that used in the previous question
3) The development of profitability 1997 to 2000 was scored on a scale of 1 to 5, where 1 means that profitability has weakened significantly and 5 that profitability has been significantly enhanced.

The relative profitability comparing enterprises in the same sector–variable was left out of the analysis as it was scored on a scale 1 to 3. In this study,

Table 5.5a Final cluster centres.

	Cluster 1 n = 95	Cluster 2 n = 230	Cluster 3 n = 67
Profit maximising	3.99	2.6	1.7
Better standard of living	4.34	3.5	2.0
Profitability	4.29	3.4	2.2

Table 5.5b Descriptive statistics of the financial indicators (x1000s euros or man-years) for the different success groups.

Success groups	Variable	Minimum	Maximum	Mean	Std. Deviation
The best performing group	Short-term success sum	1	5	4.01	0.65
	Personnel 2006	0.2	42	4.2	5.5
	Turnover 2006, 1000 €	4	5000	358.9	667.1
	Investments 2006, 1000 €	1	600	71.5	104.7
The intermediate group	Short-term success sum	1	4.75	3.67	0.55
	Personnel 2006	0.2	33	3.1	3.4
	Turnover 2006, 1000 €	7	2000	216.8	293.8
	Investments 2006, 1000 €	1	3000	68.5	220.1
The weakest performing group	Short term success sum	1	5	3.21	0.69
	Personnel 2006	0.3	10	2.3	2.0
	Turnover 2006, 1000 €	6	2500	157.9	335.9
	Investments 2006, 1000 €	1	210	33.2	49.6

Table 5.5c Kruskall-Wallis test statistics for different success groups.

	Sort term success sum	Personnel 2006	Turnover 2006	Investments 2006
Chi-Square	60.0	13.7	24.3	13.4
Df	2	2	2	2
P	<<0.001	<<0.001	<<0.001	<<0.001

the confirmatory factor analysis was not included in the question because of the low number of variables. The minimum number of variables needed is 3 when there is only one factor, and the model would fit the first rule necessary for identification. However, the analysis would be expected to run into different problems in this kind of model. For example, with only one latent variable and three observed variables, there were no degrees of freedom left, so the model could not be tested using a maximum likelihood χ^2-test. Such a model is always fitted, even if the assumption of a single common latent cause is wrong (Shipley 2002). There were not any specific reasons to fix any of the free parameters, so it was decided not to use confirmatory method.

As there was presumably only one dimension, it was tested simply by principal components analysis, which is a method used to form uncorrelated linear combinations of the observed variables. The first component has a maximum variance. Successive components ascribe and denote progressively smaller portions of the variance and are all uncorrelated with each other. It can be used when a correlation matrix is singular (SPSS 2007). According to the analysis (Appendix 4), only one principal component was categorised, and to it was attributed 54 per cent of the total variance. All variables had high loadings for that one component. Thus, the corresponding sum variable created for 2006 data was calculated in order to measure financial success for the 2001 data. The variable was scored from 1 to 5, the mean was 3.95 and with a standard deviation of 0.67.

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$$\textit{short term success 2001} = \frac{(\textit{profit}\ 99 + \textit{profit}\ 01 + \textit{profitability development})}{3}$$

5.2 Critical resources possessed by diversified farms in general

In chapter 3 it was hypothesized that '*those diversified farms that have at an adequate amount of resources when compared to major competitors, might generally perform better than farms that do not have enough resources'*. This *theoretical*[9] hypothesis was tested by observing what kind of key resources farms can draw upon and to what extent diversified farm possess such resources. Then compare these key resources by correlating them with the different success indicators. In addition, the owning of different resources was compared between success groups.

Unfortunately, there were not specific questions related to possessing critical resources in the 2001 questionnaire. This is why this chapter emphasizes solely those data collected in 2006. There were 13 variables that were selected to describe the general key of: critical resources of the farm. There are a great number of different types of resources available to farms, but in this case we tried to focus on the most important of these. The theoretical considerations are discussed in chapter 2. In this study we also had to try to cover somewhat 'universally important resources', because the study is not industry specific. It is to be expected that some resources are more important for one industry and less important for others. As this study is part of a larger investigation, the scope to ask about these resources was also limited. Therefore, an earlier questionnaire and the results of Forsman (2004) were utilised for the design in this study. Forsman (2004) had a somewhat similar theoretical perspective and her research was conducted on rural small-scale food-processing firms in Finland. In fact 39 per cent of the firms in her study data were diversified farms. It was presumed that similar factors might also be valuable in the context of this study. Thus, when questions for this present study were being formulated, her results were a useful guideline. Nonetheless, the variables in this present study are not entirely same, though similar to hers (Forsman 2007).

The respondents were asked to describe what was their own situation regarding the possession of resources when they compared their resources with those of their competitors (Likert scale scores 1 to 5; 1 = significantly weaker; 3 = similar; 5 = significantly better). In general it seems that diversified farms were in quite a good situation regarding general resources (Table 5.6). The high quality of products and services, customer relationships and professionalism of the owners were evaluated as the strongest resource when compared to those of competing firms. On the other hand, the weakest resource possessions were buildings, area and animals etc.

5.2.1 Defining the resource variables

An abstract entity such as a 'resource' can not easily be directly examined. The variables in the Table 5.6 that measure the resources are indicators of the phenomenon that is the main interest of this study (Everitt and Dunn 2001). The goal of factor analysis is to assess the extent to which various x variables in a dataset can be interpreted as a measure of the underlying constructs (Warner 2008). In this study, the author has looked at what kind of resources listed above do the variables present. Data reduction in this study is important, because none of the above resources can solely describe either tangible or intangible resources. Moreover, it would be even more difficult to make sensible classifications with 13 different variables for practical reasons. Factor analysis can be used

9 The theoretical hypothesis is different from that of the statistical null hypothesis. In this dissertation the null hypothesis H_0 states 'groups do not differ', or 'groups are not dependent,' and when the path analysis model or confirmatory factor analysis are used theH_0= estimated model is right, and H_1= estimated model is not right.

Table 5.6 Key resources compared to competitors (2006 data).

Own resources compared to competitors	n*	Minimum	Maximum	Mean	Std. Deviation
Raw materials	362	1	5	3.16	0.71
Technology, machinery	367	1	5	3.09	0.90
Buildings, area, etc	361	1	5	2.98	0.97
Capital	370	1	5	3.22	0.90
Labour	361	1	5	3.29	0.85
Innovative products/services	352	1	5	3.09	0.83
Management skills	363	1	5	3.27	0.87
Farm's image	363	1	5	3.50	0.83
Customer relationships	367	1	5	3.60	0.79
Professional skills	373	1	5	3.60	0.79
Co-operation and networks	365	1	5	3.21	0.77
Quality of the products/services	370	2	5	3.62	0.74
Logistical systems	361	1	5	3.02	0.70

*n varies between variables, as statistics have been calculated for each individual variable, missing cases are not deleted from the list.

in two alternative ways. First, it can be seen as an explorative technique to investigate relationships between variables and factors without making any prior assumptions about which variables are related to which factors. Second, factor analysis can be used as a technique for testing a specific factor structure (Everitt and Dunn 2001).

This research is, to some extent, exploratory and, to some extent, confirmatory. Because resource indicators affect other parts of this study, it was decided that the hypothesis was tested using confirmatory factor analysis. Different variables were tested whether they were a single uni-dimensional latent variable (Jöreskog 2005), or if each variable that measured a latent variable was calculated as a sum variable.

The confirmatory factor analysis is theory driven. The theoretical model on this study was derived from the theoretical assumption of resource heterogeneity of RBT and also derived from the earlier findings of Forsman (2004). Most of the resources selected for this study can be roughly divided into three groups. 1) The first group comprised basic tangible resources, such as technology available for the farm, buildings and capital. 2) The second group consisted of the 'output' (product or service) related to both tangible and intangible resources, this group includes items such as the quality of the products or services, customer relationships and firm's image. 3) The third group of variables was defined as intangible administrative resources linked to entrepreneurs' management and professional skills.

There are variables that could not be theoretically included into the above groups. First, some of the 13 variables are not 'universal' in the sense that they only apply to some farms. Three variables, namely: raw materials, logistical systems and innovative products/services could also be included into the 'output' category. However, the first two variables are very industry specific, so they are not so important for farms that operate services or trades. Thus, they were excluded from the model, but they were used as sole variables

where appropriate. 'Innovative products/services' was not included, as it measures the slightly different parameter of innovation. Innovation is often related to high quality, but a product/service does not have to be innovative in order to be of high quality. Unfortunately, other dimensions of innovation (for instance market or production) are missing, thus the indicator was used as a sole indicator where appropriate. Second, there were two variables which did not thematically fit into the above three categories. 'Co-operation and networks' and 'skilled labour' were indeed important resources for most farms. 'Co-operation and networks' is a type or resource that cannot be easily classified into the above groups. Thus it was used as a sole variable. 'Skilled labour' is similar, but it could somehow be included into all three groups. One of the basic rules of a measurement model (equivalent to the CFA) is that each indicator variable is caused by only one latent variable. In addition the validity of the variable 'skilled labour' is unfortunately questionable because the formulation was a little unclear. It can be understood in two ways: either understanding it by including the whole personnel (entrepreneur and family included), or by including only the non-family employees. For these two reasons it was not used in the analysis.

A total of 8 variables were chosen for the analysis. There were 345 cases that had all responses and after imputation using matching variables procedure 351 cases were used for analysis (Jöreskog 2005, p. 6). The bivariate normality test described in chapter 5.1 was also run to analyse these variables (Appendix 5). All RMSEA values are less than 0.1, and the *p*-value of the actual test of the model is in many cases $p > 0.05$, thus the hypothesis of underlying bivariate normality is not rejected and he variables can be used for estimations.

A correlated three-factor model was proposed as a theoretical measurement model (Fig. 5.4). The three factors (i.e. latent variables) were included in the study. The first factor represented the basic resources that were measured by the three x-variables (indicators); technology (TEC), buildings, land etc. (BUILD) and capital (CAP). The second factor ('output') denoted resources that were related to the products and services provided. It had three x-variables; customer relationships (RELA), firm image (IMAGE) and good quality of products/services (QUALITY). The third dimension is related to 'the ability to make good decisions'. It was termed 'skills' and x-variables were management skills of the entrepreneur (BSKILS) and professional skills of entrepreneur (PSKILLS).

A covariance matrix was selected also for this analysis. As stated earlier, the confirmatory factor analysis model was fitted to study data. The null hypothesis was; H_0 = *estimated model is correct*, and the hypothesis H_1= *estimated model is not correct.*

After running the confirmatory factor analysis, it was found that the model fitted the data. The χ^2 value was 16.10, df = 17 and $p = 0.51$, and Normal Theory Weighted Least Squares Chi-Square

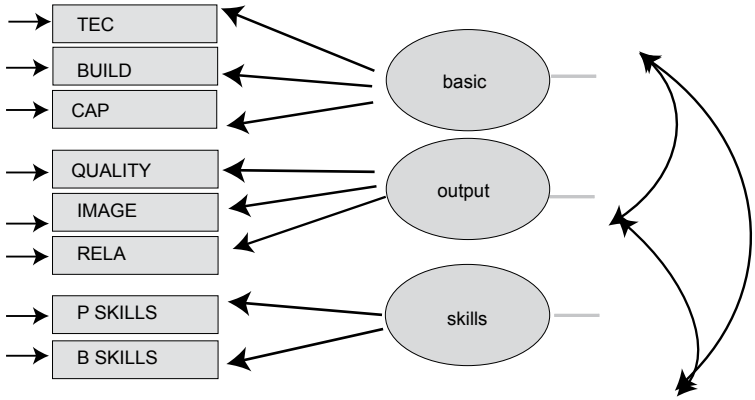

Fig. 5.4. The conceptual model.

= 16.10, p = 0.52). Consequently, H_0 was not rejected, and the model fitted the data well (Fig. 5.5 and Table 5.8). According to Root Mean Square Error of Approximation and Bentler's comparative fit index, this CFA model also fitted the data well (Table 5.8).

Individual indicators were also analysed using similar procedures to those of the analysis done in chapter 5.1. In this analysis, there were no negative variances (Appendix 5) and there were no factor loadings over 1 (Table 5.7). All t-values of each indicator were over 2, and thus meet the requirement for being statistically significant.

Cronbach's Alpha (α), composite reliability and complementary measurements of average variances extracted were used in order to determine the reliability of the individual indicators (Table 5.9). The α and composite reliability were at an acceptable levels for all constructs and the average variances extracted were acceptable for the output related resources. Although a case of low variance extracted was observed for skills and basic resources, on the whole, the assessment of the measurement did not reveal crucial deficiencies (Diamantopoulos and Siguaw 2000). In addition, the sample size was fairly large, which also increases the reliability. The recommended sample size is: 'that sample size that

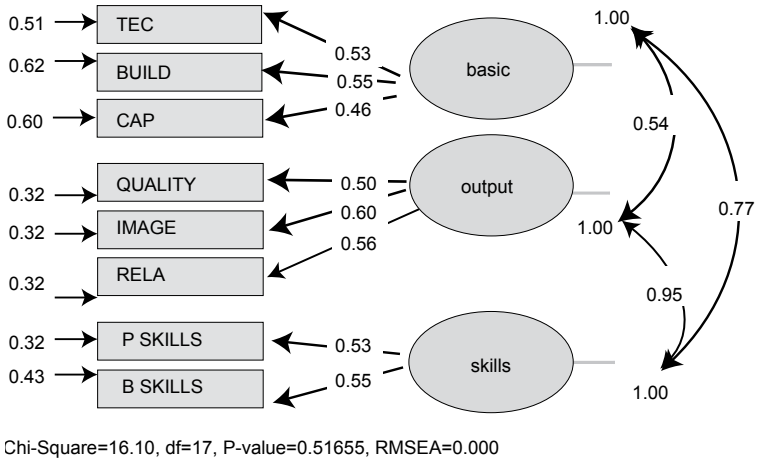

Fig. 5.5 Estimation of the result of the confirmatory factor analysis.

Table 5.7 Results from fitting the model to the data.

Measures	F1, loadings (t-values)	F2, loadings (t-values)	F2, loadings (t-values)	Error variances		R2
				estimates	t-values	
Technology, machinery	0.53 (9.37)	-	-	0.51	9.38	0.35
Buildings	0.55 (9.08)	-	-	0.62	9.76	0.33
Capital	0.46 (8.04)	-	-	0.60	10.66	0.26
Good quality of the products/services	-	0.50 (12.50)	-	0.32	10.65	0.44
Firm image	-	0.60 (14.02)	-	0.32	9.47	0.53
Customer relationships	-	0.56 (13.48)	-	0.32	9.96	0.49
Professional skills of entrepreneur	-	-	0.53 (12.52)	0.32	9.56	0.47
Management skills	-	-	0.55 (11.83)	0.43	10.47	0.42

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Table 5.8 Goodness of fit statistics.

Measures	Model	Acceptable level
CFI	1	> 0.90
RMSEA	0.000	<0.05

Table 5.9 The scale means, standard deviations, reliability measures and correlation matrix.

Constructs	Mean	SD	α	ρ_c	ρ_v	Correlation		
						1	2	3
Basic resources	3.10	0.68	0.59	0.59	0.33	1		
Skills	3.44	0.70	0.61	0.61	0.42	0.47	1	
Output	3.57	0.64	0.73	0.73	0.47	0.35	0.64	1

is at least five times more than the number of free parameters' (Shipley 2000). In this study, there were almost 19 observations per free parameter. However, it would have been better if there were more variables to measure latent variables. Unfortunately, it was not possible in this study due to the reasons given earlier.

The three sum variables that were created on the basis on this confirmatory analysis were used in other parts of this study as measures of the amount in values of 'general' resources that farms possess. The sum variables were created from original variables and they were scored on a 1 to 5 scale:

$$basic\ resources\ sum = \frac{(techology,\ machinery + buildings,\ land,\ etc + capital)}{3}$$

$$output\ relatedresources = \frac{(quality + image + customer\ relationships)}{3}$$

$$skills = \frac{(professional\ skills + managerial\ skills)}{2}$$

As stated above, the other resource variables, mainly 'co-operation and networks' were used in further analysis whenever this was applicable. The descriptive statistics of the sum variables are presented in the Table 5.9.

5.2.2 Possessing general resources and success

In this section, the new variables described in previous section, were utilised, and an analysis was made on the whole 2006 dataset. The next step of the study was to find out, whether the actual owned resources matter in terms of a firm's success. The evaluations of these were started as using a simple comparative analysis. The question that was asked was: Are different success groups different in respect of the type of their resources? The results are clear and in line with the theory; the most successful farms had on average more resources whereas, least successful had on average fewer resources than the other groups[10]. Differences are statistically significant (Table 5.10) on all measured variables.

In order to examine the observed link between critical resources and farms' successes, correlations between success variables and resource variables

10 All groups were also tested as pairs by using the non-parametric Mann-Whitney U-test. Moreover, comparison differences between pairs were statistically significant ($p < 0.05$ level), except for the variable 'innovative products/services, whereas the best performing group and the intermediate group did not differ. However, both groups were different from the weakest performing group.

Table 5.10 Differences between resources among different success groups.

	The best performing group	The mediate group	The weakest performing group	Kruskall -Wallis	*p*-value
N	86	217	58		
basic resources sum	3.41	3.06	2.77	13.94	<<0.01
output related resources sum	3.78	3.59	3.22	5.47	<0.05
skills sum	3.77	3.41	3.08	18.66	<<0.01
Co-operation, networks	3.49	3.19	2.84	21.5	<<0.01
Innovative products/services	3.23	3.11	2.82	8.1	<0.05

were studied. The Pearson correlation was tested between calculated sum variables (success sum variable, basic resources sum variable, output related resources sum variable and skills sum variable), and that of the 'contact's and networks'- variable. In addition, the correlations between the short term financial indicators were tested. According to the results (Table 5.11), the correlations between possessing these critical resources and farm successes are positive and significant, although some of them were low.

Is there a causal relationship between success and resources?

Even though 'correlation does not necessarily imply causality', the above correlations provide some evidence that there is definitely a relationship between the possessed resources and success. The correlations between the different resources and the success variables are positive and significant. In line with the previous test, the basic resources seem to correlate slightly more with the success than output related resources sum variable (Fig. 5.6). On the other hand, skills and output variables correlate very

Table 5.11 Pearsons correlation analysis between possessing of general resources and firm success, one way analysis (2006 data, list wise deletion, n = 330).

	success sum	sort term success sum	basic resources sum	output related resources sum	skills sum	co-operation, networks	innovative products/ services
success sum	1						
sort term success sum	0.45**	1					
basic resources sum	0.34**	0.35**	1				
output related resources sum	0.24**	0.21**	0.35**	1			
skills sum	0.33**	0.27**	0.47**	0.62**	1		
co-operation, networks	0.28**	0.30**	0.35**	0.48**	0.43**	1	
innovative products/services	0.15**	0.24**	0.29**	0.48**	0.44**	0.40**	1

** Correlation is significant at the 0.01 level (1-tailed).

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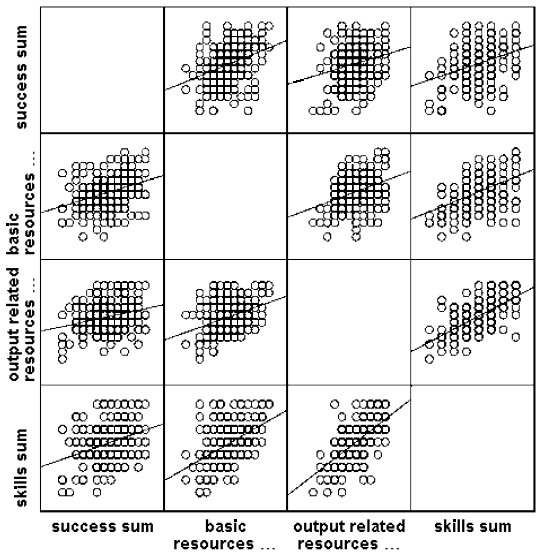

Fig. 5.6 Scatter plot of the variables basic resource sum, strategic resources sum, and success sum.

strongly. Therefore, it could be hypothesised that diversified farmers who have good management and professional skills are able to create better outputs with their resources.

The relationship between resources and success was explored by using path analysis. 5 variables were chosen for the further investigation. These variables were: success sum variable, basic resources sum variable, output related resources sum variable, skills sum variable and contacts and networks variable. The proposed causal structure contains all 4 resource factors that have direct effects on success in the theoretical framework. In addition, the skills and networks have a direct effect on the basic resources and also output related resources. Thus, these two variables have also indirect effects to the success. The proposed model is presented on the Fig. 5.7. The network and skills-sum variables are exogenous variables, i.e. they are not caused by any other variables of the model (Shipley 2002). In contrast, basic resources, output related resources and success sum variables are endogenous variables, i.e. they are caused by some other variables in the model (Shipley 2002,). The model is recursive by its nature, all causal effects are unidirectional (i.e. there is no causal effect in the 'backwards' direction) and their disturbances are uncorrelated (Kline 2005).

The structural equations and estimations of free parameters were calculated by using the LISREL program and values are presented in Appendix 6. Calculations were made by using standardised variables. Before testing, the bivariate normality was tested, and data were considered suitable for analysis. Path analysis is similar to structural equations models, i.e., the model will be fitted to the data, and the null hypothesis is similar to CFA analysis

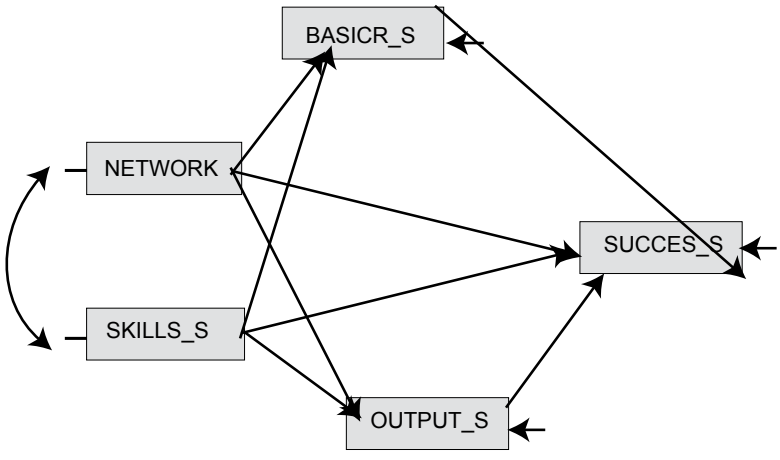

Fig. 5.7 Predicted model.

(*H_0 = estimated model is correct*, *H_1= estimated model is not correct)*.

In the Fig. 5.8, the numerical estimates free parameters are presented. The χ^2 of the model is 0.39 and the *p*-value was 0.53, thus the model is acceptable and fits the data well (Appendix 6). Both networks and skills have direct and indirect effects on success, and basic resources also have positive effect on success. Surprisingly, the output related resources have only a small and negative impact on success in the model, this finding will be elaborated on later in this chapter.

According to the results of this study, the significance of entrepreneur's skills and networks are very important for the success of the diversified farm. This can be evaluated through coefficients of determination (R^2). According to Jöreskog (2000) R^2 cannot be interpreted directly from structural equations. Thus, the interpretation is different from the regression analysis. Under certain conditions R^2 can be calculated from structural equations and can also be interpreted in recursive models, such as this. However, one should in principle calculate it using reduced form equations. Reduced form equations for this model are:

SUCCES =
0.52*NETWORK + 0.44*SKILL, Errorvar.= 4.89, R^2 = 0.13
(0.18) (0.099)
2.92 4.43

BASIC=
0.50*NETWORK + 0.59*SKILL, Errorvar.= 3.16, R^2 = 0.25
(0.14) (0.079)
3.51 7.43

OUTPUT=
0.67*NETWORK + 0.72*SKILL, Errorvar.= 2.04, R^2 = 0.45
(0.11) (0.064)
5.85 11.39

Standard errors are presented in brackets on the second row and t-values on the third row. The interpretations of the R^2 values are that 'networks and skills' explain 13 per cent of the variance of financial success. These values have a great impact on the output related sum variable; networks and skills account for 45 per cent of the variance. In addition, skills and networks have a surprisingly big effect on the basic resources; in that they explain 25 per cent of the variance. Thus, these results suggest that resources have causal impacts on the success of the firm, whereas skills and networks

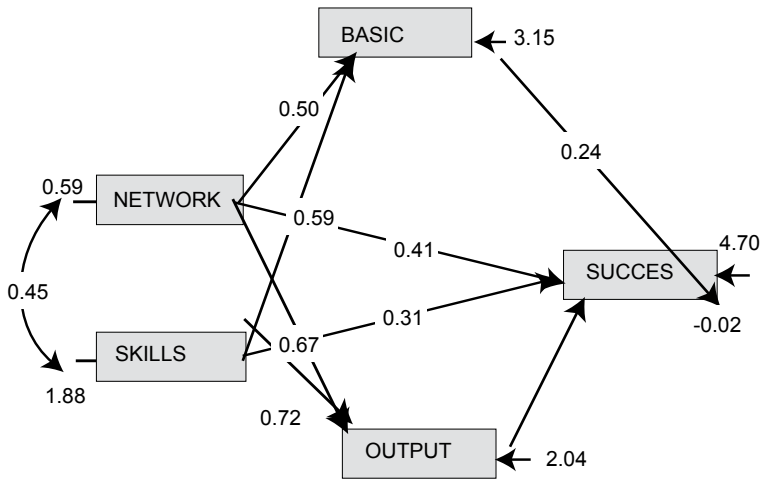

Fig. 5.8 Estimations of the path model.

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have a large impact on the other resources. This causal relationship was found even though diversified farms of the sample operate along several very differing lines of businesses. Diversified farms are mainly small businesses. Therefore there are many other factors that affect their success, such as the particular industry or changes within the markets.

Why did the output related resources have no impact on financial success?

As stated earlier, the impact of output related resources on success in the above path model is negligible (t-value less than 2). This suggests that although the model is theoretically correct, the causal relationship of the summed variables of image, quality and customer relationships on success is very small and thus does not follow the theoretical line of thinking. This might be due to a number of reasons. First, the 'skills' - variable has a large impact on the output variable and thus has an indirect effect on success. Entrepreneurs that have good skills, also have good quality products or services. The partial correlations test indicated this when the impact of skills was taken into account. The output related sum variable and success variable had no correlation (Table 5.12).

Second, there are a number of findings that indicate that economic success (as understood in this study) is not the only substantial objective for many rural small businesses owners. It has been argued that many farmers and other rural entrepreneurs are, in fact, life-style entrepreneurs that value and emphasize concepts such as: customer orientation, good leadership skills, internal marketing, cultural aspects of traditional life style, a good reputation, power, control prestige and a desire for a quiet life in addition to being in a position to pass the farm onto the next generation. These objectives are often given a higher priority than those of the financial success indicators (Potter and Lobley 1992, Gasson and Errington 1993, Cuykendal et al. 2002, Duffy and Nanhou 2002, Komppula 2002, Komppula 2004, Näkkäläjärvi 2008). Many of these aims are closely related to the output related sum variable of this study. Thus, whilst they can be viewed as resources according to resource based theory, they can also be viewed as belonging to a different success dimension than that of the perceived success point-of-view. However, it must be stressed that this explanation is not in line with RBT, and it will not be elaborated further.

Third, it should be also noted that the model is constructed from cross sectional data and only a few variables. For instance, panel data could give better evidence of the impact of the output related resources.

Fourth, the output related sum variable is connected to the concept of competitive advantage of premium pricing. As stated by Bowman and Ambrosini (2007) the competitive advantage can be divided into three groups; 1) cost advantage, 2) premium pricing advantage and 3) superior sales volumes advantage. The results of the path model suggested that higher quality of products/services had no causal effect on the financial success among diversified farms. In the 2006 questionnaire it was asked if there were specific types of competition (price, quality, expansion) that the diversified

Table 5.12 Partial correlations.

Control Variables		output related resources sum	success sum	skills sum
-none-a	output related re-sources sum	1		
	success sum	0.26**	1	
	skills sum	0.64**	0.36**	1
skills sum	output related re-sources sum	1		
	success sum	0.05	1	

farm faced. The responses were evaluated on a scale from 1 to 4, 1 equals to 'not at all, and 4 'extremely high'. In addition, it was asked how the farm could compete in these different types of situations; evaluation was on same scale of 1 to 4. Responses to these questions did not directly answer the question: 'What kind of competitive advantage the farm has, if any?' However, they gave further information under what kind of situations diversified farms operate

The results of this study reveal about 39 per cent of those that operated in the sector experienced price competition at a reasonable level. In contrast, 43 per cent reported competition for quality and 30 per cent for expansions (i.e. volumes). In addition, 22 per cent felt that they faced both price and quality competition, whereas15 per cent reported competition for both price and expansion. A further 15 per cent were aware of both quality and expansions competition. Most of the respondents felt that they could, to some degree, compete for these factors (Fig. 5.9.) and especially on the quality issues.

The financial success and the ability to compete for these different aspects were explored further. The above three variables of how these farms could compete for different types of objectives were reclassified into two groups, one for those farms that could compete (i.e. had evaluated their ability on scale 3 or 4) and another for those who could not (i.e. had evaluated their ability on scale 1 or 2).

In general, those farms that were able to compete successfully for certain types of enterprise objectives (price, quality or expansion) were more successful overall and also had more general resources than those farms that were not able to compete (Table 5.13). The only exception was quality competition. Many of the respondents felt that they could compete on quality and there were no statistically significant differences between groups as measured by the success sum variable between groups. Furthermore, those farms that were able to compete on price or on expansion had higher success and resource means than those farms that were able to compete on quality.

It can be concluded from these findings that not many diversified farms have actually created a competitive advantage on premium quality and premium price markets. Most of the farmers thought that they could compete on quality, but they failed to get higher prices for their products, because quality did not show on the financial success. Thus, in general diversified farmers might not have been able to get a premium price for their high quality products/services. They had not been able to differentiate their products enough from those of their competitors. There is also an alternative explanation. A certain minimum high quality is often required as 'standard' that has to be maintained just to stay in the market. Prices and other factors are often important competition components, including customer structure. For instance, many diversified farmers operate machinery contracting services for the public sector (clearing snow off roads etc.). In this type of situation the farmer can provide a cer-

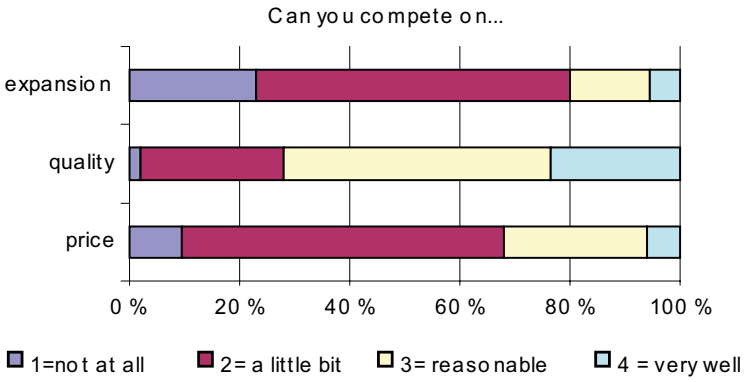

Fig. 5.9 How diversified farms can response to competition (n = 387).

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Table 5.13 Competition, success and resources.

Price competition	Cannot compete (n = 260)	Can compete (n=122)	Mann-Whitney	*p*
Success sum variable	3.14	3.37	13245	<<0.01
Short term success 2006	3.59	3.84	11983	<<0.01
Basic resources	3.01	3.28	10100	<<0.01
Skills	3.30	3.72	9462	<<0.01
Output related	3.46	3.83	9384	<<0.01
Co-operation. networks	3.11	3.41	11286	<<0.01
Quality competition	Cannot compete (n = 107)	Can compete (n=275)	Mann-Whitney	*p*
Success sum variable	3.07	3.26	12818	0.07
Short term success 2006	3.48	3.75	10907	<<0.01
Basic resources	2.87	3.20	8971	<<0.01
Skills	3.14	3.56	8599	<<0.01
Output related	3.28	3.70	7882	<<0.01
Co-operation. networks	2.99	3.29	10002	<<0.01
Expansion competition	Cannot compete (n = 303)	Can compete (n=76)	Mann-Whitney	*p*
Success sum variable	3.16	3.42	9458	<0.05
Short term success 2006	3.61	3.91	8238	<<0.01
Basic resources	3.00	3.50	5942	<<0.01
Skills	3.33	3.86	6174	<<0.01
Output related	3.51	3.88	6759	<<0.01
Co-operation. networks	3.13	3.54	7503	<<0.01

tain minimum standard quality of service, but price is often important for the customer. Thus the client is not willing to pay a higher price for premium quality. The competitive advantage of diversified farms should be evaluated with more detail and industry specific data.

5.2.3 Summary

The overall findings of this section are in line with that of the theoretical framework. The most successful farms did possess more of the critical resources than the less successful farms. Success variables correlated positively with used resource variables (basic resources, output related resources, entrepreneurs skills and networks) and causal link between resources and success was proved. Rather surprisingly, it seems that output related resources (image, good quality of product, customer relationship) are not causally linked to financial success. This might be due the limits of the analysis (cross-sectional data, only very limited number of variables), or because farms have not build competitive advantages on premium quality and pricing.

5.3 The use of joint resources on diversified farms

The second theoretical hypothesis created for this study was '*Joint resources may be the way that a diversified farm gains needed resources and thus help it to be more successful'*. In theory the use of joint resources could have two kinds of effects on a farm's success. First, it can have direct effects on success by decreasing costs and thus increasing profits. Second, joint resources, might exert an indirect effect on success by having a positive effect on general resources and thus contribute to the farm's success. On the other hand, joint resources might hinder success when one or more resources becomes limiting for any given enterprise output because of the alternative demands that are put on its use (Lynn and Balachandran 2007). For instance, if the same machinery is used both for agricultural work and for contracting, there might be situations that a joint resource would be needed for both purposes at the same time. There are only a few studies that have discussed the use of resource transfer and use in diversified farms (Alsos and Carter 2006, Pascotto 2006, Torkko and Belt 2007). These studies especially focus on how agricultural resources have been exploited in non-farm businesses. However, to the best of the author's knowledge, the use of joint resources *per se* in diversified farms has not been exclusively studied earlier. This part of the study is explorative in nature. In the 2006 survey questionnaire there were 8 questions related to the use of originally exclusively agricultural resources for other non-agricultural activities and 7 questions related to the use of the originally exclusively non-agricultural resources for farming enterprises. Unfortunately, there were no such variables that can address this activity in the 2001 data.

5.3.1 Indicators of joint resources

In the 2006 survey there were 15 variables, that were related directly to the use of joint resources. A total of seven variables considered the use of agricultural resources for the other business activities and one question was related to the use of forestry for other business activities. In addition, there were seven questions, which covered the use of similar non-farm resources in agriculture. The questions were formulated thus: 'How much do you utilise your own farm's resources in your other entrepreneurial activities?' (question 54) and 'How much do you utilise the resources of your non-agricultural entrepreneurial activities in your farming?' (Question 55). The responses were evaluated using the Likert scale (scoring from 1 to 5), where one was equal to 'not at all' and five 'very much'. The list of all 15 variables and descriptive statistics are presented (Table 5.14).

These data suggest the use of joint resources is very common among diversified farmers. There were only 3 cases where none of the listed resources were not in joint use. Thus, it can be said that farmers fully exploit the opportunities of using joint resources.

Practically none of the variables listed were normally distributed (Fig. 5.10), in fact nearly all were skewed. According to Jöreskog (2005) there are three alternative actions regarding the situation where underlying bivariate normality does not hold even approximately (such as for skewing). First, one can reduce the number of categories. This can be done to any of the variables, but not to all of them. Second, one can eliminate the most skewed variables and thus obtain more homogeneity for the remaining variables. Third, the probability of the various response patterns might be dependent on covariates such as gender, age or income. Unfortunately, none of these procedures could help with the situation regarding these data. The numbers of categories were reduced for the 'worst' variables, but it did not help with the problem. There were no theoretical grounds to remove any of the variables. Moreover, the problem was common for all the variables. The third option, which *ceteris paribus* was good, but there were no clear background variable that could be used as a control variable. This is why it was decided to use the simple non-parametric procedure of Kendal's tau to explore the phenomenon further.

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Table 5.14 List of variables and descriptive statistics for the use of joint resources in the data of 2006.

Variables	n*	Minimum	Maximum	Mean	Std. Deviation
Raw materials and by-products of agriculture	366	1	5	2.4	1.49
Machinery and equipment of farm	362	1	5	3.4	1.28
Farm buildings, areas, animals etc.	367	1	5	3.4	1.29
Farm labour	362	1	5	3.3	1.48
Farming know-how	361	1	5	3.8	1.09
Farm as the source of financing of non-farm activity: collateral and cash-flow financing	363	1	5	3.1	1.37
Farm contacts and networks	361	1	5	3.1	1.25
Forestry	365	1	5	2.9	1.38
Products and by-products of non-farm activity	363	1	5	2.3	1.26
Non-farm machinery and equipment	366	1	5	2.9	1.28
Non-farm buildings, areas	363	1	5	2.4	1.34
Non-farm labour	361	1	5	2.8	1.46
Non-farm know-how	362	1	5	3.3	1.25
Non-farm activity as a source of financing for agriculture: collateral and cash-flow financing	365	1	5	2.6	1.39
Non-farm Contacts and networks	361	1	5	2.8	1.23

*n varies between variables, as the statistics have been calculated for each individual variable, missing cases are not deleted from the list.

5.3.2 Relationships between joint resources, general valuable resources and firm success

The next question is: How the use of resources affects to the success of the diversified farm? This was analysed by using non-parametric correlations (Table 5.15). The results suggest the use of joint resources has only an indirect effect on success in most cases. The success variables correlated with 'the joint use of agricultural machinery and equipment', 'the joint use of non-farm machinery and equipment', 'products and by-products of non-farm activity' and 'the use of non-farm activity as finance source of agriculture'. Correlations were moderate, but positive and statistically significant. The first two variables suggest that farms might actually be able to create economies of scale on machinery. For example, when the same machines were used for several activities, it had a positive affect on profit. Surprisingly, these two variables did not correlate with basic resources as such, though they had moderate correlations with the 'general technology and machinery' (Kendals tau = 0.12 and 0.13 $p << 0.001$). It can be concluded that the joint use of machinery entails the more efficient use and working hours for machines, which will reduce the cost per unit. Similarly, using the use of non-farm activity as finance source of agriculture correlated positively with financial success, as there was less need for external loans, thus profits could be higher. However, the entrepreneur should remember to calculate interest rate on the own capital invested on the enterprise.

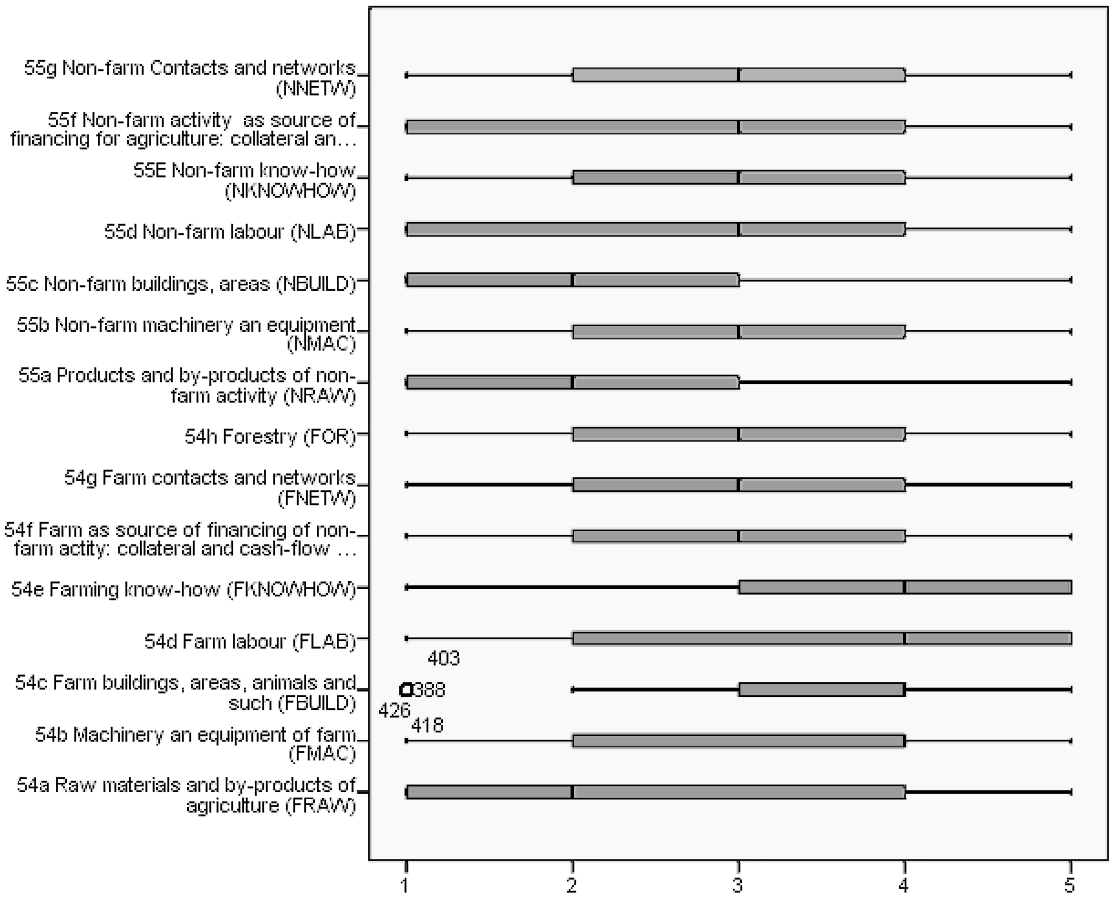

Fig. 5.10 The box blots of joint resource variables.

Products and by-products of non-farm activity are seldom used, but if they are, they correlate positively with financial success. Naturally, this kind of joint use of resources was typical for farms in which animal husbandry was combined with processing, or plant production was combined with primary production (other than agriculture, e.g. fur farming, reindeer herding or aquaculture) or trade.

Basic resources did not correlate with any use of joint resources. However, the use of non-farm buildings had positive and significant correlations with general building resources (Kendals tau 0.12, $p < 0.05$). Several joint resources correlated with general resources. Therefore it can be concluded that joint resources affect mainly indirectly the financial success, but they have some relationship with resources and do affect them. The joint resource variables were tested also among different success groups. Among the 15 variables there was only one,[11] which differed, thus this finding supports the view that joint resources do not have direct effect on financial success.

11 That variable was '55f Non-farm activity as a source of financing for agriculture: collateral and cash-flow financing (NFIN)', the average of the best performing group was 3.0 and the weakest performing group 2.09, Kruskall-Wallis test $p < 0.01$)

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Table 5.15 Correlations between variables of the joint resources, general resources and success (Kendal's tau correlation).

Variable	success sum	Sort term success	basic resources	output related resources	skills	Innovative	Co-operation, networks
54a Raw materials and by-products of agriculture	0.02	–0.02	–0.08	0.05	0.00	0.10*	–0.02
54b Machinery and equipment of farm	0.07	0.11*	0.08	0.12*	0.17**	0.11*	0.04
54c Farm buildings, areas, animals and such	–0.02	0.03	0.06	0.12*	0.09	0.08	0.03
54d Farm labour	0.02	0.06	0.01	0.09	0.11*	0.02	0.01
54e Farming know-how	–0.02	0.01	0.07	0.16**	0.20**	0.17**	0.06
54f Farm as source of financing of non-farm activity: collateral and cash-flow financing	0.00	–0.02	0.02	0.05	0.07	0.07	0.04
54g Farm contacts and networks	–0.02	0.01	0.05	0.15**	0.19**	0.14**	0.14**
55a Products and by-products of non-farm activity	0.10*	0.11*	0.03	0.07	0.11*	0.05	0.07
55b Non-farm machinery and equipment	0.14**	0.10*	0.07	0.08	0.20**	0.06	0.17**
55c Non-farm buildings, areas	0.08	0.04	0.07	0.03	0.08	–0.03	0.11*
55d Non-farm labour	0.06	0.03	0.02	0.08	0.09	0.03	0.10*
55E Non-farm know-how	0.01	–0.02	–0.01	0.13**	0.15**	0.12*	0.09
55f Non-farm activity as source of financing for agriculture: collateral and cash-flow financing	0.12*	0.04	0.01	0.07	0.03	0.04	0.05
55g Non-farm Contacts and networks	0.08	0.05	0.07	0.15**	0.17**	0.16**	0.19**

**Correlation is significant at the $p < 0.01$ level (2-tailed), * correlation is significant at the $p < 0.05$ level.

5.3.3 Summary

The above results suggest that use of joint resources might impact on general resources of farms and, thus have indirect effects on the farm's success. However, these data also suggest the efficient use of joint resources does not have a direct effect as such on successes when the population of diversified farms is studied. The use of joint resources expressed as the individual original joint resource variables were tested among different success groups. Among the 15 variables there was only one, which differed. These results do not mean that joint resources do not have a major role in the success of these diversified farms. To the contrary, they actually underline the meaning of joint resources: practically speaking all diversified farms of this survey used joint resources to varying degrees. It would be very informative to study this issue further by making a comparative study between diversified farms and competing non-diversified farms within same production system.

5.4 Learning and knowledge management

In chapter 3 it was hypothesized that: *'those diversified farms that gather, share and process information*

efficiently for their decision-making are more successful than the others'. This theoretical hypothesis is based on the theories of learning enterprise and decision-making. Learning an enterprise is a practical approach of how information is gathered, then shared and used in decision-making.

5.4.1 Descriptive analysis (2001 data)

The question specifically directed at evaluating the learning organisation or other knowledge-based activities were not designed or included in the 2001 survey. However, there were some questions that were to a certain extent linked to the issue. There are very few of these questions, their scoring is not perfect and they give a very narrow picture. Even so, they can still give some preliminary ideas about and basic data on how information is gathered, shared and whether they correlate at all with success indicators. For the purpose of this study, questions were divided as: 1) questions related to information gathering and 2) questions related to information sharing and processing.

Information gathering and success
The following seven questions were classified as information-gathering queries. A single sum variable was created from the responses to the question: to how many entrepreneur associations do you belong? Other variables were analysed as sole variables

MEMBERSIP SUM = question 14 + question 15 + question 16 (range 0–3).

- Question 14. Are you a member of the farmers union? (0 = no, 1 = yes)
- Question 15. Are you a member of the Federation of Finnish Enterprises or member of its local branches? (0 = no, 1 = yes)
- Question 16. Are you a member of some other entrepreneurial association? (0 = no, 1 = yes)
- Question 17. How often do you participate in the events that are intended for entrepreneurs (exhibitions, seminars, training courses)? (0 = Never/less than once a year, 1 = 1-2 times a year, 2 = Few times a year, and 3 = at least once a month)
- Question 18. How often do you read newspapers and magazines that are aimed at entrepreneurs? (0 = never, 1 = occasionally, 2 = at least once a month, 3 = at least once a week or more often)
- Question 19. Do you read literature that is aimed at entrepreneurs? (0 = no, 1 = yes)

The results showed that a large majority of the diversified farmers belonged to at least to one association of entrepreneurs in 2001. Most of the respondents also participated in the different events, although the share of non-participating respondents was, at almost one out of three, surprisingly large. Nearly all did at least occasionally read newspapers and magazines and three out of four read specialised literature aimed at entrepreneurs (Fig. 5.11).

The variables of the 2001 survey are rather skewed, many important aspects were missing, and none of variables by themselves were sufficient to measure information gathering. However, when variables were cross tabulated (Appendix 7) and tested by using contingency tables and tested for significance (χ^2-test), all the variables were found to be dependent on each other. The two exceptions to this were: the sum variable of being a member of entrepreneurial associations and whether the respondent read the literature aimed at entrepreneurs.

Information sharing and processing questions
There were two questions in the 2001 questionnaire that were to any extent related to information sharing and processing:

- Question 20. With how many people do you discuss matters that are related to your enterprise every week? (1 = no-one, 2 = one person, 3 = 2– 3 persons, 4 = 4–10 persons, 5 = more than 10 persons)
- Question 21. Do you have contact to a person with whom you can confidentially and openly discuss all possible matters related to your enterprise? (0 = no, 1 = yes)

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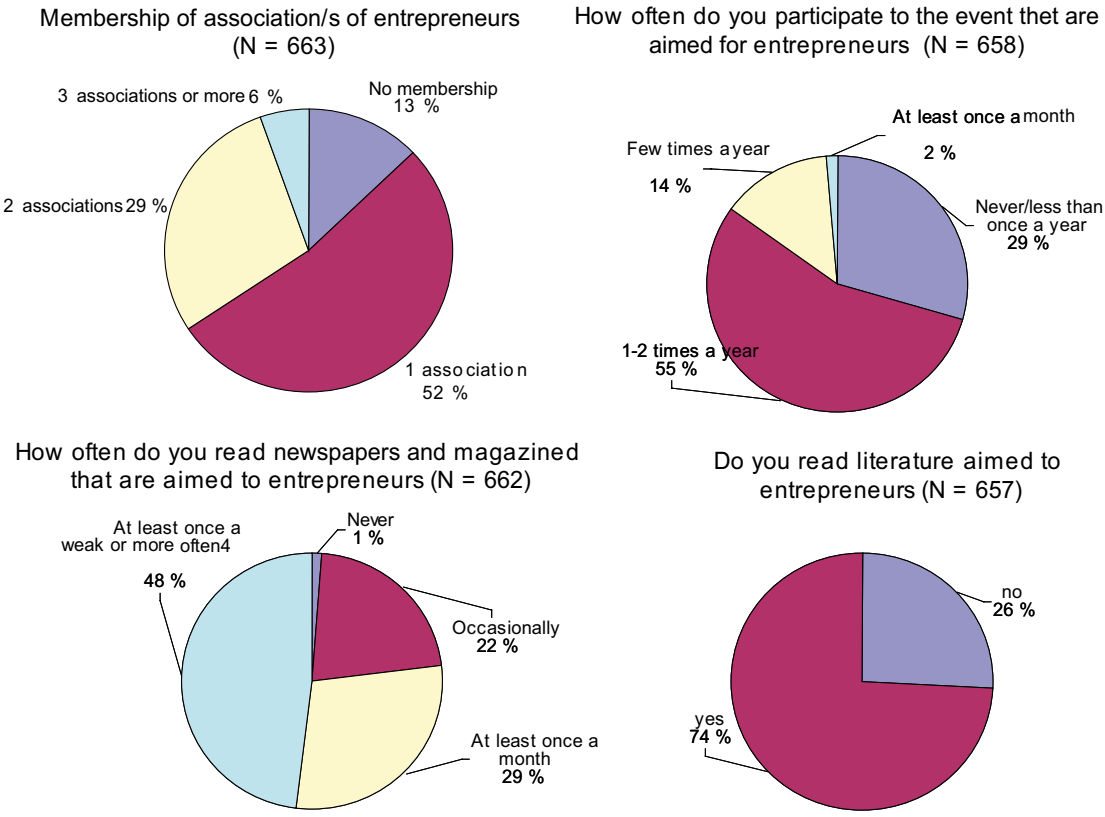

Fig. 5.11 Responses to the questions that were classified as being related to information gathering 2001.

Most of the respondents discussed with at least one person on a weekly basis. In addition, most respondents had at least one person to talk to about every issue concerning their enterprise. Naturally, these two variables were dependent on each other ($\chi^2 = 55.4$, df 4, $p < 0.01$) information gathering between groups 'there is at least one trusted person to talk with' and 'no trusted person'. On the other hand, when the data covering both questions were compared, the respondents that discussed their businesses with more people were also more active at information gathering. The difference was statistically significant ($\chi^2 = 54{,}4$, df 4, $p < 0.01$).

Links to financial success and resources

All six variables discussed above were tested in respect of the success variable. Learning processes take time, so it was expected, that some differences would show later, rather than immediately (in the short-term). To study this effect, the success variable for 2001 was tested against the whole 2001 dataset. In addition both success variables for 2006 and resource variables for 2006 were tested against the 2001 data by comparing the 2001 grouping with the 2006 outcome using panel data.

The only differences between groups in the 'short-term success 2001' variable were found in answer to the question 'with how many people do you discuss matters that are related to your enterprise every week'. Those entrepreneurs, who we able to discuss matters related to their farms with several people every week, were the most successful. In contrast, those respondents who talked to more than 10 people or were not able to talk to

anyone were the least successful (Table 5.16). Differences were statistically significant (χ^2=13.45, df 4, $p < 0.01$). The result is quite logical and in line with qualitative studies among diversified farmers which gave similar results. Those diversified farmers that could not talk about matters relating to their enterprises, felt that the diversification strategy had failed, whereas those who divided responsibility and had discussions were satisfied (Rantamäki-Lahtinen 2007).

According to the panel data, there were no statistically significant differences between any groups for the 2006 success variables (success sum variable and short term success variable 2006). However, there were significant differences between the groups for the variable relating to 'With how many people did you discuss items that are related to your enterprise every week?' and 'Possessed general resources 2006'. There were also significant differences between the groups variable 2006: 'Do you read literature that is aimed at entrepreneurs in relation to skills?' Those entrepreneurs who were able to talk about matters related to their farm with several people every week possessed more available general resources in 2006. In contrast, those respondents who were not able to talk to anyone had the least amount of general resources (Table 5.17). The latter results were logical. Moreover, those respondents who read professional literature, also had better skills (Mann-Whitney U = 3432, Z = -2.16, $p = 0.03$), thus the literature variable might indicate more interest in learning and enhancing their skills.

In the 2001 data many important aspects related of information gathering, sharing and processing were missing. However, these questions indicated that diversified farms are *heterogeneous* in this respect. The relationship between success and information process is not straightforward. Many aspects of the learning processes affect decision-making, and hence indirectly affect success. Furthermore, knowledge can be viewed as a valuable resource, from this perspective. It can also have a direct effect on a farm's success.

Table 5.16 Descriptive statistics on success 2001 variable, grouping variable is 'With how many people did you discuss items that are related to your enterprise every week?'

Group	N	Minimum	Maximum	Mean	Std. Deviation
No-one	26	2	4.7	3.86	0.61
One person	130	1	5	3.92	0.68
2-3 persons	343	1	5	3.95	0.65
4-10 persons	91	2	5	4.12	0.65
over 10	29	1	5	3.61	0.86

Table 5.17 Descriptive statistics and results of Kruskall-Wallis test, 2001 grouping and 2006 resource variables and success sum variable, panel data (n = 211).

Variable	No-one	One person	2–3 persons	4–10 persons	More than 10	Kruskall -Wallis	*p*
N	8	41	127	29	6		
Success sum	2.70	3.12	3.31	3.28	3.11	6.94	0.14
Basic resources sum	2.52	3.07	3.13	3.28	3.50	10.28	< 0.05
Skills sum	2.81	3.29	3.39	3.83	3.58	19.12	<<0.01
Output related resources sum	3.50	3.51	3.51	3.93	3.67	11.11	< 0.05

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5.4.2 Exploratory analysis of information gathering and sharing variables (data 2006)

When the 2006 survey was designed, learning enterprise theory was taken into account. There were a total of 25 questions related to the information gathering, sharing and processing in the 2006 questionnaire. Information gathering and sharing questions were evaluated by Likert scale (scores 1–5). Six questions were related to information processing. The first three questions were asked and the response given as a continuous variable, whereas and the responses the three others were scored from 1–3. The descriptive statistics and classification of these variables are presented on Table 5.18. These data suggest, that the personal contacts with other entrepreneurs and professional newspapers were seen as the most important ways of getting information. In contrast, TV and radio were the least important. As the businesses were small, the most important ways of sharing the information was through 'coffee table' conversations and other casual means.

As stated above, there were 15 variables that measured information gathering and five information sharing. None of them can solely represent information gathering as it can be done in many ways. Data had to be reduced for practical reasons. It would be even more difficult to make a sensible interpretation with 15 different variables. Although the questions had a theoretical basis, there was no prior information about the individual variables. The exception to this was the 'trial and error' variable, which has been important independent variable in other studies (Cope 2005). To the best of the author's knowledge, this kind of analysis has not been conducted on diversified farms before. That is why the only explanatory factor analysis was run for the whole data, and the factor scores were used as variables at the later stages of the analysis. The relationship between information gathering, sharing, processing, decision-making and success was examined later.

Data gathering and sharing were analysed collectively, because their definitions overlapped to a certain extent. The variables correlated with each other and were quite interactive. For instance, it was found that needed information could be both gathered and shared through an intranet or internal e-mail. There are 19 times more observations than variables on the exploratory factor analysis, the sample size is as stated about 380, and the measurements are metric. Data are suitable for factor analysis and meets the basic requirements for factor analysis.

Before doing the factor analysis, a reliability analysis was conducted. The Cronbachs Alfa (α) for reliability was 0.88, so reliability of all 20 variables was sufficient for further analysis. Pairwise deletion was used for missing data, because if a listing procedure were used, almost one in 90 cases would be missing from that data. In the first analysis it was found that two variables had low communalities and were excluded from the analysis. Excluded variables were 'trial and error' and 'vocational school', both of which also thematically present different aspects compared to those of the other variables and thus probably measure a different dimension than the others.

A principal axis factor analysis resulted in a five-factor solution, which accounted for about 61 per cent of the total variance of the original variables (Appendix 8). The number of factors was defined by using the cut-off point of 1 in Eigen values. An orthogonal Varimax rotation was performed. The rotated factor structure (Table 5.19) is clear, though some variables had moderate loadings of at least two factors. The latter variables were quite sensible. For instance, the variable 'internal meetings and courses' had the main loading on the 'internal networks' factor and also moderate (less than 0.4) loadings on 'documents' and 'external networks' factors. The factors are interpreted as described in the following sentences. Factor 1 represented gaining information through 'official channels', i.e. information that is gathered from extension services and different state/regional/provincial authorities. This type of information is often firm/industry specific. Factor 2 represents information gathered from 'internal documents', such as income statements, balance sheets and certification systems. Factor 3 covers 'professional channels', which refers to pro-

Table 5.18 Variables, descriptive statistics and classification.

Information gathering	n*	Minimum	Maximum	Mean	Std. Deviation
How important for your enterprise are the following ways of information gathering and learning? Think of all the persons working for the enterprise. Scale: 1 = not at all, 5 = very important					
Advice given by municipality level authorities	388	1	5	2.9	1.3
Advice given by other authorities (employment and economic development centres)	388	1	5	3.2	1.2
Advisory services (ProAgria etc.)	389	1	5	3.0	1.2
Vocational school	386	1	5	3.4	1.0
Professional books (reports, manuals)	389	1	5	3.5	0.9
professinal and trade newspapers	389	1	5	3.7	0.9
Personal contacts to other entrepreneurs	389	1	5	3.9	0.9
Personal contacts to advisers	387	1	5	3.0	1.2
common seminars and lectures to entrepreneurs	382	1	5	3.2	1.0
Internet	387	1	5	3.2	1.2
Television, radio	389	1	5	2.5	1.1
Customer surveys	387	1	5	3.6	1.1
Income statements and balance sheets	387	1	5	3.7	1.1
Tax information	389	1	5	3.7	1.1
Trial and error	381	1	5	3.0	1.2
Variables related to the information sharing	**n**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
How important are the following channels to share the information? Scale: 1 = not at all, 5 = very important					
'Coffee table' conversations and other casual means	386	1	5	3.49	1.22
Via internal e-mail lists, intranet	385	1	5	2.34	1.27
Other internal information (notes on board, oral advices)	382	1	5	2.72	1.29
Internal meetings, training courses	381	1	5	2.62	1.29
Using quality handbooks and similar processes	382	1	5	2.32	1.26
Variables related to the information processing	**n**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
How many persons are involved in making short-term (less than 1 year) decisions?	379	1	8	1.95	099
How many persons are involved of making medium term (1–5 years) decisions	379	1	10	2.00	1.00
How many persons are involved of making long term (over 5 years) decisions	372	1	12	2.02	1.13
How important it is knowledge gathering and sharing, when decisions are made in the Scale 1 = not important, 2 = quite important, 3 = very important					
… short term	365	1	3	2.26	0.64
… medium term	362	1	3	2.30	0.62
…. long term?	359	1	3	2.28	0.65

* N varies between variables, as statistics have been calculated for each individual variable, missing cases are not deleted list wise.

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Table 5.19 Rotated factor matrix.

Variable	F1 'Official channels'	F2 'Internal documents'	F3 'Professional channels'	F4 'External networking and media'	F5 'Internal networking'
Advice given by other authorities (employment and economic development centres	0.80	0.21	0.09	0.14	0.14
Advice given by municipality level authorities	0.75	0.06	0.22	0.07	0.10
Advisory services (ProAgria etc.)	0.71	0.26	0.12	0.21	0.01
Income statements and balance sheets	0.16	0.73	0.27	0.11	0.15
Information from certification systems etc.	0.12	0.61	0.07	0.31	0.14
Tax information	0.22	0.60	0.27	0–14	0.07
Writing things down to certification systems	0.19	0.49	–0.03	0.28	0.24
Professinal newspapers	0.16	0.09	0.82	0.12	0.01
Professional books (reports, manuals)	0.13	0.14	0.64	0.14	0.10
Personal contacts with other entrepreneurs	0.12	0.16	0.47	0.22	0.21
Television, radio	0.15	0.14	0.12	0.50	0.07
Information through e-mail lists, intranets	0.05	0.14	–0.07	0.48	0.15
Internet	0.06	0.07	0.24	0.47	0.13
Common seminars and lectures for entrepreneurs	0.19	0.18	0.34	0.46	–0.08
personal contacts to advisers	0.34	0.18	0.24	0.45	–0.02
Customer surveys	–0.01	0.19	0.22	0.36	0.24
Other internal information (notes on board, oral advice)	0.10	0.23	0.06	0.28	0.73
'Coffee table' conversations etc	0.09	0.10	0.35	–0.01	0.44
Internal meetings, training courses	0.11	0.38	0,05	0.37	0.43

Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.

fessional literature, newspapers and personal contacts with other entrepreneurs. Factor 4 represents information gathering and sharing through media and external networks. These media include, the Internet, TV and radio and common seminars etc. Factor 5 denotes information gathering and sharing through the farm's internal networks, such as coffee table discussions etc. Factor loadings were used as variables in further analyses.

The descriptive statistics of factor scores are shown (Table 5.20).

5.4.3 Information processing and the role of decision-making (data 2006)

No matter how efficiently information is gathered and shared within the farm, if it is not actually utilised for decision-making, it will not beneficially affect the farm's performance. How important was information gathering in the decision-making process: was a question, which was asked in the 2006 survey. The question was asked in three time dimensions. The short term was determined as operational level decisions, i.e. plans that are less

than 1 year to their implementation. The medium term was determined as a tactic level i.e. from one to five years to their implementation. The long-term was determined as strategic level ranging from five to 10 years to their implementation. In addition, it was asked how many people were involved in the decision-making processes these dimensions. It was expected that decision-making process might be different in farms in which more people were involved. As shown in the Fig. 5.12 the respondents felt that information gathering and sharing is important in decision-making. Less than 10 per cent felt that gathering and sharing information was not at all important and 37 to 39 per cent felt that it was very important. The respondents valued knowledge gathering and sharing similarly, regardless of the length of time involved: i.e. respondents regarded it as important for the short medium and long terms and *vice versa*. All groups were dependent on each other and this dependency was statistically significant ($p << 0.001$).

Theoretically the relationship between information and success is indirect. Information gathering, sharing and processing has an impact that affects decisions regarding resources and thus it also has affects success. Naturally, other different factors affect decision-making. From another point-of-view: i.e. effective information gathering and sharing processes could in theory also be a valuable resource as such.

The importance of knowledge gathering and sharing in the short, medium and long-term decisions were dependent. Therefore a sum variable 'INFOSUM' was created to illustrate the use of gathered and shared information. Before the sum variable was calculated, missing data were imputed according to the answer to the other two questions (if the medium term answer was missing and two others were coded as 1, the missing answer was imputed as being also 1).

INFOSUM = M43A2 'How important is knowledge gathering and sharing in the short-term?' + M43B2 'How important is knowledge gathering and sharing in the medium term?' + M43C2 'How important is knowledge gathering and sharing in the long-term?'

Table 5.20 Descriptive statistics of the factor scores.

Factor scores of …	n	Minimum	Maximum	Mean	Std. Deviation
F1 'Official channels'	349	–2.37	1.81	–0.04	0.89
F2 'Internal documents'	349	–2.24	2.07	0.00	0.87
F3 'Professional channels'	349	–2.86	2.14	0.02	0.89
F4 'External networking and media'	349	–2.20	1.90	–0.01	0.77
F5 'Internal discussions and networking'	349	–1.89	2.08	0.01	0.80

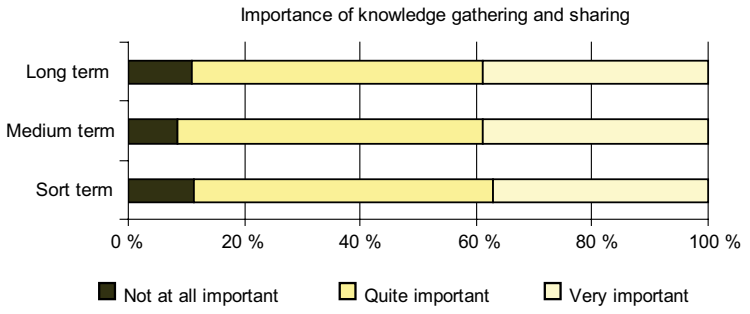

Fig. 5.12 Responses to the question: 'How important is the information gathering and sharing in the short term/medium term/ long term decision-making'.

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The mean of the INFOSUM variable was calculated, and based on the means of cases that were categorised into three groups: 1) 'Information gathering and sharing is not important in decision making' (mean 1–1.49), 2) 'Information gathering and sharing has some importance in decision making' (mean 1.50–2.49) and 'information gathering and sharing is very important in decision making' (mean 2.50–3.0).

The number of people participating in the decision-making at different levels correlated strongly (Kendals tau correlation coefficients: short term and medium term: 0.73, $p << 0.001$, short- and long term 0.59, $p << 0.001$, medium and long term 0.83, $p << 0.001$). Therefore the average was calculated and used as a measure of the number of people involved. Descriptive statistics of the two created variables are shown in Table 5.21. The sum variables correlated positively with each other (Kendals tau correlation coefficient 0.35, $p << 0.001$), i.e. the more people that were involved in the decision-making; the more important the gathering and sharing of information was considered to be.

5.4.4 Learning enterprise and the success of the diversified farms.

It can be concluded that diversified farms are heterogeneous according to the methods they gather, share and process information. Quite logically, the information gathering and sharing is more active on those farms in which information is actively used in the decision-making process. In Table 5.22, the fac-

Table 5.21 The descriptive statistics of the infosum-variable and the number of decision-makers.

	N	Minimum	Maximum	Mean	Std. Deviation
Infosum	357	2	6	3.85	1.75
Number of decision makers	381	1.00	9.33	1.98	0.96

Table 5.22 The means and test values of knowledge gathering and sharing variables.

Variable	[1)]Knowledge gathering and sharing is not important, means	[2)] Knowledge gathering and sharing has some importance, means	[3)] Knowledge gathering and sharing is very important, means	Test	F/χ^2	*p*-value
n	29	181	119			
F1 'Official channels'	–0.21	–0.02	–0.05	K	1.1	0.591
F2 'Internal documents'	–0.64	–0.11	0.36	K	42.9	<<0.001
F4 'External networking and media'	–0.49	–0.04	0.18	V	9.7	<<0.001
F5 'Internal discussions and networking'	–0.49	–0.03	0.24	V	12.2	<<0.001
Trial and error	2.8	2.9	3.1	K	3.2	0.207
Number of decision makers	1.26	1.88	2.38	K	7.5	0.024

V= Variance analysis, K = Kruskall-Wallis non-parametric variance analysis

tor scores for information gathering and the original variables that were excluded from the factor analysis were compared between different infosum means groups. With the exceptions of: 'official channels', and 'trial and error' the groups of variables differed in every aspect. Respondents belonging to group 'knowledge gathering and sharing is not important' were also found to be less active in collecting information than those of the other groups.

It was hypothesised that farms that use collected data more actively in their decision-making have better resources and are thus more successful. According to the analysis made between the groups that are based on the info sum mean, groups were different in output related resources, skills and co-operation. However, there were no statistically significant differences between success sum or the short-term profit variable (Table 5.23).

Some background factors were checked. On those farms in which agriculture was relatively big compared non-farm activities, the use of 'official information' was more important than in other groups. Differences were statistically significant (Kruskall-Wallis test $\chi^2 = 18.88$, df =2, $p << 0.001$). The reason for these differences is that in farming in Finland there is much more interaction with the farm and the regional administrations and other authorities than with other industries. This interaction is related to the eligibility and application for agricultural subsidies. For other kinds of knowledge gathering, the groups did not differ. Moreover, the effect of the type of businesses were tested, and it was found that internal networks were significantly more important for services and trade than for primary production or industry (Variance analysis F = 6.06, df = 2, $p < 0.01$). In other respects there were no differences in knowledge gathering, sharing or processing.

Finally, the correlations between success variables, different resources and knowledge gathering, sharing and processing were compared (Table 5.24). Success sum variable correlated only with factor 2 the 'internal documents'-variable, and barely with the number of decision-makers. The 'output related resources' variable correlated with: 'the infosum variable', 'number of decision-makers', 'F4 external networks and media' variable and the 'F5 internal discussions and networking'-variable. In addition, the 'basic resources' variable significantly correlated ($p < 0.05$) with the 'number of decision-makers' and with the 'F2 internal documents'-variables. The 'skills sum' variable correlated with everything else, other than the 'F1 official channels' variable. The 'co-operation and networks' variable correlated with the infosum variable, 'F2 internal documents', 'F4 external networking and media' and 'F5 internal discussions and networks' variables. Thus one can conclude that learning had an indirect effect on the success via the intangible and sometimes tangible resources. These results

Table 5.23 The means and test values of different resources.

Variable	1) Knowledge gathering and sharing is not important, means	2) Knowledge gathering and sharing has some importance, means	3) Knowledge gathering and sharing is very important, means	Kruskal-Wallis	*p*-value
Success sum	2.93	3.24	3.24	4.0	0.133
Sort term success indicator	3.57	3.72	3.70	17.2	<<0.001
Basic resources sum	2.86	3.14	3.18	10.3	0.006
Skills sum	3.07	3.42	3.56	57.0	<<0.001
Output related resources sum	3.29	3.54	3.73	5.7	0.058
Co-operation. networks	2.97	3.17	3.33	3.8	0.150

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Table 5.24 Kendals tau correlations between information gathering, sharing, processing and resource variables.

	number of decision makers	F1	F2	F3	F4	F5
Number of decision-makers	1					
F1 'Official channels'	0.02	1				
F2 'Internal documents'	0.19**	0.06	1			
F3 'Professional channels'	0.06	0.07	0.02	1		
F4 'External networking and media'	0.09*	0.05	0.19*	0.03	1	
F5 'Internal discussions and networking'	0.13**	0.01	0.09*	0.02	0.10*	1
Co-operation, networks	0.04	0.02	0.09*	0.06	0.12**	0.14**
Success sum	0.08*	0.03	0.17**	0.02	0.05	0.07
Basic resources sum	0.09*	0.05	0.09*	0.06	0.04	0.02
Output related resources sum	0.13**	–0.02	0.08	0.05	0.14**	0.23**
Skills sum	0.10*	0.03	0.09*	0.13**	0.10*	0.11*
Vocational schooling	0.11**	0.27**	0.21**	0.27**	0.24**	0.13**
Trial and error	0.03	0.10*	0.12**	0.20**	0.15**	0.13**

also underline the importance of sharing ideas in decision-making. In fact the number of decision makers correlated positively with most of the tested variables. The results are in line with the panel data findings discussed earlier and suggest that in the diversified farms and small businesses context, learning and knowledge sharing have an indirect effect on financial success through the use of other resources.

5.5 Capital and labour constraints; over-diversification

Over-diversification is a phenomenon that has been claimed to affect a farm's success adversely. The theoretical hypotheses were formulated as: 'Over-diversification might affect the farm's success negatively; and over-diversified farms are less successful than their non-diversified counterparts'. For both of the datasets there were two questions related to those constraints that can cause a diversified farm to become over-diversified; whether farms had enough labour and capital (questions B10 in 2001 survey data and 52 in the 2006 survey data) to run both, the agricultural and other business, simultaneously. Over-diversification is not the only possible cause of labour and capital becoming constraining in specific firms. A possible alternative reason is when farms are on a growth phase whilst using resources so efficiently that these become limiting. For instance, bootstrapping can be defined as maximising the use of resources. The motivation for bootstrapping can brought about by through: the conscious striving for frugality, finding creative ways to avoid external financing, reducing overall costs, or improving cash flows (Ebben and Johnson 2006). Bootstrapped firms though lacking capital and labour, could not be described as overstretched, if they go on to achieve future success. Thus, those farms that lack capital and/or labour

are not considered as being 'over-diversified', but constrained. These questions were asked and scored on the 1 to 5 Liker scale, (1 = strongly disagree, 5 = strongly agree). Thus these data were classified by using the k-means cluster technique. Subsequently, this classification was tested by using discriminant analysis. The latter was used only to support the decision concerning the relevant cluster solution in cluster analysis

5.5.1 Grouping of the farms

K-means cluster analysis was accomplished by using two to five cluster solutions. Theoretically, a four-cluster solution provided the best analysis for both datasets and the final outcomes were easy to interpret. Similar groups were found for both datasets, and this gives good evidence that this kind of phenomenon really exists (Table 5.25).

After the k-means cluster analysis was completed, discriminant analysis was conducted. In this study, the definition of these groups was made in line with cluster analysis. The same variables that were the bases of clustering were also used as independent variables for discriminant analysis to confirm the number of clusters and also to verify the cases classification. Similar testing of results by cluster analysis, or for other pre-defined groups by using discriminant analysis are common (Nummenmaa 1997, Davies et al. 1998, Pollalis 2003, Forsman 2004).

The basic assumptions behind discriminant analysis are: that cases are independent, variables have a multivariate normal distribution, within-group variance-covariance matrices are equal across groups, and that the relationships between groups are linear (Nummenmaa 1997, Hair 1998, SPSS 2007). In common with many other multivariate analysis techniques, discriminant analysis is a robust method (Ranta et al. 2002). According to Hair (1998), unequal covariance matrices can negatively affect the classification process, if the sample size is small. However, this problem can be ameliorated by increasing the sample size. In this research, the low *p*-value of the Box M-test (Appendix 9) indicated that the equality of the covariance was not supported. Nonetheless, due to the large sample size one possible effect violating this assumption was decreased. There are only two independent variables (labour and capital) for the analysis, and these variables are correlated (Kendals tau B correlation coefficient is 0.346). However, according to Hair (1998) multicollinearity[12] can sometimes cause problems, especially when progressive step-by-step methods are used. In such a case, simultaneous estimation can be used providing the discriminant function is based on the entire set of variables, regardless of the discrimination power of each independent variable. Moreover, as stressed above, the discriminant analysis in this study is used only to support cluster analysis. In this study, Wilk's lambda, a statistical measure that examines whether groups differ in at least one linear combination of the dependent variables (Hair 1998), was considerably smaller in the four cluster solution compared to solutions with fewer clusters (Table 5.26), although in all cases a $p << 0.001$ was calculated and thus the null-hypothesis 'there are no discriminating functions' was rejected. On the other hand, the difference for the five-cluster solution was small and in both datasets the original k-means grouping was exactly the same as when than classifications were made by discriminant analysis. Discriminant analysis supports the decision about selecting the four-cluster-solution. As the fundamental principle is to get the simplest structure that still represents homogenous groupings, the four-cluster solution was theoretically the most clear. Therefore it was chosen.

For both datasets there were two canonical discriminant functions that were used in the analysis, and the datasets were quite similar. The discriminant power of the first function for the prediction of the group membership was significantly greater in both datasets than for second function; in 2001 data the first function explained 71.5 per cent and 2006 data 73.1 per cent of variance (Table 5.27).

12 Multicollinearity means that two or more independent variables are highly correlated (Hair 1998).

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Table 5.25 Final cluster centres, 4 group solution, k means cluster.

2001 data	Cluster	Cluster	Cluster	Cluster
Final Cluster Centres	1	3	2	4
We have enough labour for farming and other businesses	4.6	4.4	2.0	1.8
We have enough capital for both farming and other businesses	4.5	2.3	3.9	1.6
2006 data	Cluster	Cluster	Cluster	Cluster
Final Cluster Centres	1	2	3	4
We have enough labour for farming and other businesses	4.4	3.9	1.9	1.8
We have enough capital for both farming and other business	4.5	2.6	3.9	1.6

Table 5.26 Comparing the homogeneity of different cluster combinations.

2001 data (n = 597)	2 clusters	3 clusters	4 clusters	5 clusters
Wilks' Lambda	0.176	0.111	0.034	0.024
The percentage of originally grouped were correctly classified (%)	96.8	92.3	100	100
Smallest group, n	259	105	95	51
Biggest group, n	338	259	240	240
2006 data	2 clusters	3 clusters	4 clusters	5 clusters
Wilks' Lambda	0.231	0.127	0.54	0.34
How many originally grouped cases were correctly classified (%)	98.9	97.6	98.4	97.0
Smallest group, n	150	61	53	51
Biggest group, n	220	188	158	152

Table 5.27 Eigen values and the percentage of variance of the discriminant functions.

2001 data	Eigen value	% of Variance	Cumulative %	Canonical Correlation
Function 1	6.920	71.5	71.5	0.9
Function 2	2.761	28.5	100.0	0.9
2006 data	Eigen value	% of Variance	Cumulative %	Canonical Correlation
Function 1	5.252	73.1	73.1	0.9
Function 2	1.936	26.9	100.0	0.8

If the discriminant function was statistically significant and the classification accuracy was acceptable, the focus was turned to making a substantive interpretation of the findings. In the case of simultaneous analysis such as the analysis in this study, there are two different ways to determine the relative importance of each independent variable when discriminating between groups; 1) standardized discriminant coefficient (weight) and 2) structure correlations. The standardized discriminant coefficient is often referred as the discriminant weight method. In this method each coefficient represents the relative contribution of its associated variable to that function. The coefficient can be either positive or negative. However, when their effects are evaluated, only the absolute values are taken into account; and the sign merely shows the direction of the effect. Variables with relatively larger absolute values of coefficients contribute more to the discrimination function than variables with smaller absolute values. Structure correlations (often referred as discriminant loadings) measure linear correlations between the independent variable and the discriminant function, and are interpreted similarly as factor loadings (Hair 1998).

In both datasets in this study, standardized canonical discriminant function coefficients were built up similarly (Table 5.28 and 5.29). In the first case, both functions are comparatively relevant in determining the relationship, though in the 2001 data, labour was found to be more important. Consequently, it can be interpreted as 'general sufficiency of labour and capital'. Moreover, in the second function both variables were relevant, but the capital variable was more important and labour had a negative sign. Therefore, it can be interpreted that the relationship between the capital and labour was inverse. In addition, the structure correlations support the interpretation of standardized discriminant coefficient. The output of discriminant analysis is presented in Appendix 9.

The resulting four clusters were labelled on the basis on profile characteristics of the resource allocation.

Table 5.28 Standardized canonical discriminant function coefficients.

2001 data	Function 1	Function 2
We have enough labour for farming and other businesses	0.866	-0.509
We have enough capital for both farming and other businesses	0.421	0.912
2006 data	Function 1	Function 2
We have enough labour for farming and other businesses	0.725	-0.691
We have enough capital for both farming and other business	0.644	0.767

Table 5.29 Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions.

2001 data	Function 1	Function 2
We have enough labour for farming and other businesses	0.908	-0.419
We have enough capital on both for farming and other businesses	0.507	0.862
2006 data	Function 1	Function 2
We have enough labour for farming and other businesses	0.766	-0.643
We have enough capital on both for farming and other businesses	0.690	0.724

1) 'No problems' (2001 data n = 240, 2006 data n = 158)

Farms in this group had enough capital and labour in order to run both agriculture and the other business(es) simultaneously.

2) 'Problems with labour' (2001 data n = 153, 2006 data n = 79)

Farms in this group had enough capital, but they were adversely affected by the lack of labour.

1) 'Problems with capital' (2001 data n = 95, 2006 data n = 81)

Farms in this group had sufficient labour, but they the lacked needed capital.

2) 'Capital and labour resource constrained' (2001 data n = 106, 2006 data n = 53)

The groups and the share of each group of the total population were somewhat similar between the survey years. Most farms, 60 per cent for the 2001 data and 57 per cent for the 2006 data reported certain problems with resource allocation (Fig. 5.13). Even so, distinctly capital and labour resource constrained farms were a minority (18% for 2001 and 16% for 2006 data). The capital related problems were more common in the 2006 dataset, whereas labour related problems where more prevalent in 2001 dataset.

The 2006 dataset has actually two divisions of farm data 1) farms in the panel data and 2) farms in the additional sample. In this kind of situation, there is always the possibility that data between years are skewed. Categorical data compare samples vs. belonging to certain groups and these are analysed by using the χ^2 test. According to this test there were *no* significant dependency between the samples ($\chi^2 = 3.17$, df 3, $p = 0.366$) thus firms from different samples were evenly distributed.

The next issue to consider is whether the same farms can be classified into the same groups for the different years. In greater detail: whether over-diversification is a lasting situation or is just a temporary phase. Moreover, are over-diversified farms more likely to have failed or have divested some of their diversified enterprises to specialise in only one line of business? A total of 324 farms that were diversified in 2001, responded to the 2006 survey. Of these 44 had quit all entrepreneurial activities, 18 still ran their non-farm business but no longer farmed. A total of 27 had quit their non-farm business but continued farming. Thus 236 farms were still diversified. A total of 16 respondents that had quit were already 60 years old or older in 2001, thus these cases were excluded from the following analysis, as it was assumed that reaching retiring

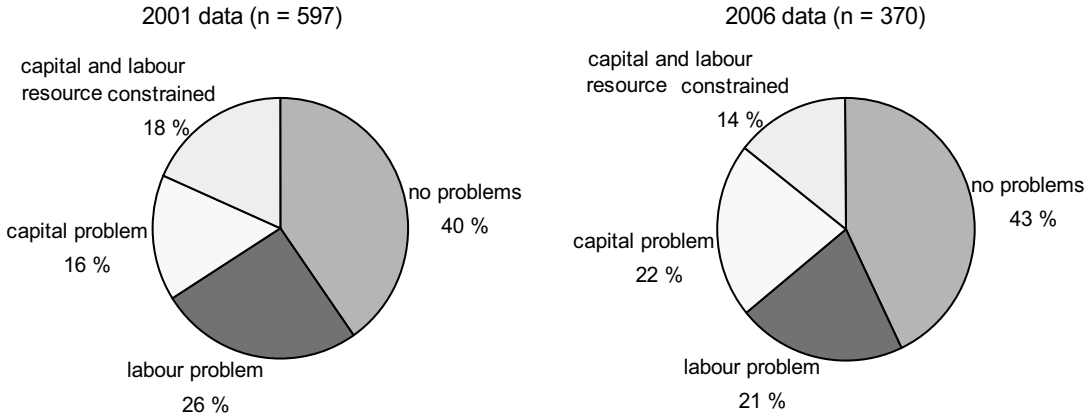

Fig. 5.13 The share of the groups of the whole data 2001 and 2006.

age was one of the reasons for their quitting. The 'capital and labour resource constrained' group had no effect on whether the farm had continued to be diversified or not ($\chi^2 = 2.631$, df 3, $p = 0.457$).

These data indicate that capital and labour resource constrains might be a temporary phase rather than a lasting state. Panel data (n = 208) were analysed by cross tabulation and tested by using the χ^2 test. The analysis revealed that there was *no* significant dependency between the groups ($\chi^2 = 12.38$, df 9, $p = 0.20$), i.e. the 2006 grouping was not dependent on the grouping of 2001 data. In fact, only 33 per cent of the farms were classified into exactly the same group in both survey years. For instance, 9 farms in both datasets (4% of the total) were classified as 'capital and labour resource constrained', and 41 cases (20% of the total) were classified into the group 'no problems' (Table 5.30).

Knowledge is a very important variable that should be measured, when resource constrains are studied. Knowledge can be seen as the most crucial resource (Hitt and Ireland 2002). Unfortunately, questions concerning knowledge were not included in the 2001 survey. Even though the question concerning knowledge was added to the 2006 survey, it cannot be used for this kind of comparative analysis. Variables measuring the possible constrains of knowledge 'we have enough know-how to run both, the agricultural and other businesses' was thus tested only in the 2006 data. The question was asked and scored on a Likert scale with scores ranging from 1 to 5, (1 = strongly disagree, 5 = strongly agree). Differences between groups were analysed by using Kruskall-Wallis non-parametric variance analysis, which showed that there are statistically significant differences between groups ($\chi^2 = 34.48$, df 3, $p << 0.0001$). The results were logical as many respondents in the group designated 'no problems' felt that they had sufficient know-how. In contrast, many of the 'capital and labour resource constrained' group felt that they had problems (Table 5.31). Thus, this result also confirms the classifications made between different firm types.

5.5.2 The effects of resource constraints

The next logical question to consider was whether capital and labour constrains matter especially, if it is only a temporary phase in most cases and not a permanent disadvantage. In theory, disadvantages of over-diversification should manifest themselves as a down turn in a farm's performance. One such manifestation could take the form of over-diversified

Table 5.30 Cross tabulation between years, panel data (n = 208).

		no problems 06	labour problems 06	capital problems 06	capital and labour resource constrained 06	Total
no problems 01	Count	41	22	17	6	86
	% of Total	20	11	8	3	41
labour problem 01	Count	21	11	13	10	55
	% of Total	10	5	6	5	26
capital problem 01	Count	12	5	7	7	31
	% of Total	6	2	3	3	15
capital and labour resource constrained 01	Count	9	9	9	9	36
	% of Total	4	4	4	4	17
Total	Count	83	47	46	32	208
	% of Total	40	23	22	15	100

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Table 5.31 Characteristics of the 'know-how' - variable.

group, data 2006	n	Minimum	Maximum	Mean	Std. Deviation
no problems	158	2	5	4.34	0.63
labour problem	77	2	5	3.84	0.93
capital problem	80	2	5	3.91	0.79
capital and labour resource constrained	53	1	5	3.51	1.19

Table 5.32 Descriptive statistics.

2001		n	Minimum	Maximum	Mean	Std. Deviation
no problems	Short-term success	223	2.0	5.0	4.11	0.61
labour problem	Short-term success	145	2.3	5.0	4.04	0.63
capital problem	Short-term success	90	1.3	5.0	3.70	0.70
capital and labour resource constrained	Short-term success	101	1.0	4.7	3.69	0.69
2006		n	Minimum	Maximum	Mean	Std. Deviation
no problems	Short-term success sum	157	2.0	4.8	3.84	0.55
	success sum	156	1.7	5.0	3.48	0.73
labour problem	Short-term success sum	78	2.0	5.0	3.79	0.60
	success sum	78	1.0	4.7	3.23	0.77
capital problems	Short-term success sum	79	1.5	5.0	3.46	0.64
	success sum	80	1.0	5.0	2.93	0.72
capital and labour resource constrained	Short-term success sum	53	1.0	4.5	3.40	0.68
	success sum	53	1.0	5.0	2.78	0.86

farms performing weaker than their normal counterparts. If resource constrains are related to some other phenomenon, like bootstrapping, farms that had resource constrains should have equal or better performance later. As discussed earlier in this chapter, financial success in this study is measured by two variables in 2006 and only one variable (short term success) for the 2001 data. Thus (Table 5.37) analysis shows that over-diversification does produce effects on financial success. In both datasets, 'capital and labour resource constrained' farms and farms with capital problems were less successful as measured by economic indicators. By the same token, 'no problems' and 'labour problems' groups were more successful. These findings are in line with theoretical considerations presented in the chapters 2 and 3. These two success dimensions were tested by using Kruskall-Wallis non-parametric variance analysis (Table 5.32). The differences between groups were statistically significant ($p << 0.001$) for both datasets and all tested variables. Thus these data verify that capital and labour resource constrains had effects on the profit and profitability of farms.

Finally, even if capital and labour resource constrains were only a temporary phenomenon, as to whether it had lasting effects was also investigated. Farms included were tested in the panel data by using the Kruskall-Wallis non-parametric test. Success variables from 2006 data were tested but the grouping variable was the 2001 grouping. These data were the least complete compared to many other tested data in this dissertation. Nonetheless, 225 cases did provide data regarding success indicators in the 2006 dataset. The evidence indicated that farms that were either capital and labour resource constrained or had problems with capital sufficiency in 2001 were still less profitable five years later that their 'no problems' counterparts (Tables 5.33a and b). These differences were statistically significant. These results indicate that constrains are probably caused by over-diversification rather than by certain other factors, such as bootstrapping, because in these data for this group of farms no success was achieved later on.

5.5.3 Resources and the other characteristics of the groups

The next step was to describe what types of farms had labour and capital resource constrains, and see, whether there are any common denominators that could give deeper insights into the phenomenon. As was stated earlier, capital and labour resource constrained farms were less successful when success was measured using profit-related indicators. In addition, it might only be a temporary phenomenon.

First, the differences between the use and possession of resources were examined. Capital and labour resource constrained farms and farms that had capital problems had fewer basic resources in use than the other two groups (Table 5.34). The 'no problems' group had the highest average number of all resources whereas the over diversifiers had the lowest. Even so, differences were statistically significant only for basic resources. However, there

Table 5.33a Descriptive statistics of success indicators.

Groupings 2001	Variables	N	Minimum	Maximum	Mean	Std. Deviation
no problems	Short-term success sum 2006	97	1.00	5.00	3.80	0.69
	Success sum 2006	96	1.33	5.00	3.43	0.77
labour problem	Short-term success sum 2006	59	1.00	4.75	3.80	0.69
	Success sum 2006	56	1.67	5.00	3.31	0.74
capital problem	Short-term success sum 2006	32	1.00	4.75	3.46	0.78
	Success sum 2006	32	1.00	4.67	2.84	0.84
capital and labour resource constrained	Short-term success sum 2006	37	1.00	5.00	3.37	0.94
	Success sum 2006	37	1.00	4.67	2.93	0.81

Table 5.33b Results of the Kruskall Wallis-test.

	Sort term success sum 2006	Success sum
$\chi 2$	12.3	20.0
Df	3	3
p	<0.01	<<0.001

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Table 5.34 Over-diversification and firm's overall general resources 2006 data.

	no problems	labour problem	capital problem	capital and labour resource constrained	$\chi 2$	*p*-value
Basic resources sum	3.30	3.10	2.91	2.83	25.62	<<0.001
Output related resources sum	3.64	3.53	3.55	3.47	2.3	0.537
Skills sum	3.52	3.34	3.42	3.30	3.2	0.362
Co-operation, networks	3.34	3.11	3.14	3.12	6.1	0.108

were clear and statistically significant differences between groups for the variable 'we have enough knowledge to run both agriculture and non-agricultural businesses'.

Before using any statistical tests for the characteristics that might affect a farm being resource constrained or not, those farms that were classified as either 'capital and labour resource constrained' (n = 9) or 'no problems' (n = 41) in both datasets were scrutinised closer. Because of the very small sample sizes, statistical tests were not conducted. These data suggest that, permanently 'capital and labour resource constrained' farms were almost always animal production enterprises. Moreover, the farm size and total sales were below average. For most of these farms the proportion devoted to agriculture was at least equal or bigger than the other businesses and they had no other capital assets (such as forestry) that they could use to finance their enterprise. On the other hand those farms that never had any problems with capital and labour were mostly involved in crop production, their farm size and total sales were larger than average and in most of them the proportion of activities devoted to agriculture was less than or equal to the other non-agricultural enterprises.

After this brief overview of these special groups, the whole data were analysed. First, differences between personal characteristics: age, sex, education level and entrepreneurial experience (years) of the respondent were tested, but there were no significant differences found between groups. The next step was to compare the farms' characteristics. These characteristics were the calculated to other business(es) within a farm, production line, lines of non-farm business, general resources, use of joint resources, loans/sales, forestry etc. The possibilities of financing the farm, or farm size in terms of personnel and turnover were also compared. The tested background variables did not differ between groups. One can conclude that there is no specific single background factor that endangers the farm to become labour and capital constrained, the phenomenon is more complicated.

6 Conclusions and discussion

The resource-based theory provides a promising theoretical framework for farm resource-level analyses of farm diversification from a farm management study point-of-view. Although resource-based theory is seldom used in farm management studies, somewhat similar ideas and approaches have been used by researchers, advisers and farmers themselves. For instance, calculating the gross margins for different agricultural enterprises, and then optimizing the gross margin of the farm, has been used by practitioners for decades. Farms and rural areas have many specific valuable resources

that can be turned into non-agricultural products and services. In the current turbulent situation of agricultural markets, these non-farm products and services might give better profits in the long run than conventional farm enterprises in many cases.

Most of the research concerning on-farm diversification has concentrated on business start-up or farm survival strategy. Resource allocation and also financial success have not been in focus yet. In this study these subjects were studied. Thus the focus of this study was the resource allocation and the financial success of diversified farms from a farm management perspective. In this study the determination of a resource that could be understood as 'production factors' or 'inputs' in neo-classic economics, has been widened to cover intangible items such as learning and skills.

The key question addressed in this dissertation, is how tangible and intangible resources of the diversified farm entity affect the economic success of a farm. The research questions were formulated as:

- What kinds of resources do diversified farms possess in general, and to what extent do farms use joint resources?
- Do these possible differences between farms affect their financial success?
- How do knowledge-gathering, sharing and processing affect farms' performances?
- How does over-diversification affect the financial success of the farms?

Four theoretical hypotheses were created based on these four key research questions, and the results are discussed in the light of the created hypotheses. In this dissertation success is understood as financial success.

Two datasets were utilised in this study: first, data were collected in a postal survey in 2001 (n = 663), and second, data were collected in a follow-up survey in 2006 (n = 439). The 2006 data consists of two smaller datasets: panel data from the 2001 survey and an additional sample. Most of the analysis relied more on the data collected in 2006, because the 2001 data did not have many questions on resources. However, 2001 data were used wherever possible. Data were analysed by using quantitative methods, and especially by multivariate data analysis. The causal relationship between resources and success was studied by using path analysis, which is a specialised version of the structural equations model method (SEM). Structural equations models are increasingly used in many fields of strategic management and entrepreneurship studies. However, to the best of the author's knowledge, they have not been applied to study the effects of farm diversification on success outcomes. Moreover, they are seldom used in farm management studies *per se*. However, Forsman (2004) used a similar approach when she studied rural small-scale food processing firms.

6.1 Main findings

In general, these results support the ideas presented for the theoretical framework. Diversified farms performed differently. According to the results of this study, financial success and resources were causally linked. On the other hand, this causal link is not the only factor explaining success; for instance networks and skills did explain 13 per cent of the variance of financial success. Professional and management skills affected other resources, and hence directly or indirectly success. Basic assumptions behind RBT have been criticized (Gibbert 2006b, Gibbert 2006a), and naturally all diversified farms are different in terms of which resources are critical for them (Torkko 2006). However, in the light of empirical analyses of this study, owned tangible and intangible resources impacted on financial success even in diversified farms in general. Results are in line with the findings of other studies including the results of Olavarrieta and Friedman (2008), which provide data from Chile supporting the proposition that firm-specific resources and capabilities can provide an explanation for a firm's performance. Naturally, it is clear that other factors also affect the extent of success. Such factors include general economic development and industrial structure. The empirical results of Galbreath and Galvin (2008)

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revealed a firm's resources explain more about its success than its industrial structure, but still both of these are needed. In this study it was not possible to take account the factors that were related on specific non-agricultural industries, but it brings new information about the link between resources and the success.

Relationship between resources and financial success

The first theoretical hypothesis was formulated as *'Those diversified farms that have at an adequate amount of resources when compared to their major competitors perform better than those farms that do not have enough resources'*. The overall findings of this are in line of the theoretical framework. The most successful farms possessed more general resources than less successful farms. Success variables correlated positively with used resource variables (basic resources, output related resources, entrepreneurs skills and networks). Despite of this positive correlation, rather surprisingly, it seems that output related resources (image, good quality of product, customer relationship) were not causally linked to the financial success. In some other studies Olavarrieta and Friedman (2008) similar factors including reputation resources have been found to be a significant element of overall success in a South-American context. Similarly, Forsman (2004) found that innovative products are connected to competitive advantage and success. The reason that a causal link could not be proved in this study, might be due the limits of the analyses used (cross-sectional data, only limited number of variables). In addition the 'skills' variable has a large impact on the output variable. Thus it has an indirect effect on success. Entrepreneurs that have good professional and managerial skills also have good quality products and/or services, and the partial correlations indicate the extent of the relationship. However, the finding might also reveal another thing. The output related sum variable is connected to the concept of competitive advantage of premium pricing. There are also other types of competitive advantages, such as price or superior volume advantage (Bowman and Ambrosini 2007). In general, those farms that were able to compete for certain types of competition (price, quality or expansion) were more successful and also had more general resources than those farms that were not able to compete for the same variable. The only exception was 'quality' competition. The data suggest that only a few diversified farms have created a competitive advantage for premium quality and premium price markets. A certain high quality is often required as a 'standard' that has to be maintained just to stay in the markets. Prices and other aspects are often important competition factors as well, including customer structure. Thus there are different ways to create competitive advantages.

The findings of this study underline the importance of skills and networks for the entrepreneur(s). These include the direct and indirect effects between other resources and financial success, the causal link of which were studied by using structural path model. The finding is in line with other studies. Pyysiäinen and Vesala (2007) found that in the current turbulent situation, entrepreneurial skills are essential for farmers. The studies of Haber and Reichel (2007b) and Lerner and Haber (2000) stress the crucial role of entrepreneurial human capital and especially managerial skills, in the small firm performance. Similarly Miller et al. (2003) found that in the small rural US retail and service firms, internal managerial factors are in the key role when the different internal factors affecting the firm performance are explored. According to Casson (2005) the theory of entrepreneurship emphasises that the manager's entrepreneurial ability is the most important human resource of a firm. All the other resources, especially human resources are derived from those of the entrepreneur since he is the one who selects these people. Casson (2005) also argues that one of the most important forms of entrepreneurial activity is the ability to identify market-making opportunities, in particular the discerning of changes in demand and the creation of new markets to meet need demands. Managerial ability and entrepreneurial ability should be seen as different human resources, and they should have different measures in empirical analysis. However, as Metcalfe (2004) states both concepts are needed and often needed simultaneously, in order to under-

stand how the bundles of resources are controlled by the firm and how the farm develops. This study focuses more on the management side. Professional and management skills are intangible resources and can be intentionally enhanced. An operational environment is volatile and uncertain and there are a variety of development paths that diversified farmers can follow. Therefore diversified farmers that are 'armed' with good managerial and professional skills are more likely to make good decisions and obtain competitive advantages over other available resources as well.

The second theoretical hypothesis of this study was: '*Joint resources may be the way for a diversified farm to obtain needed resources, and thus help it to become more successful'*. The use of joint resources could in theory have two kinds of effects on a farm's success. First, it can have direct effects by decreasing costs and thus, increasing profits. On the other hand, it might have indirect effects by having a positive effect on general resources and thus farm success. The downside to the use of joint resources is the possible accumulation of needs for a particular resource. This makes the resource limiting and thus hinders achieving the desired output (Lynn and Balachandran 2007). An example of this is: if the same machinery is used for both agricultural work on the owner's farm and for outsourced contracting, there might be situations that that the piece of equipment is needed for both activities at the same time. There are a few studies that have discussed the use of resource transfer and use in diversified farms, especially how agricultural resources are exploited for non-farm businesses (Alsos and Carter 2006, Pascotto 2006, Torkko and Belt 2007).

Practically speaking all respondents of this study used either agricultural resources for non-farm businesses or non-farm resources for agriculture. To share resources in this way is a pragmatic opportunity recognised by farmers. However, using joint resources is very common, therefore the variables were skewed and normality was not achieved, which restricted their use for analysis. The data obtained in this study suggest that the use of joint resources might have an impact on general resources of the farm and, thus have indirect effects on its success. These data also suggest that the efficient use of joint resources does not have a direct effect as such on a farm's success when the population of diversified farms was studied. The individual original joint resource variables were tested among different success groups. There was only one variable among the 18 variables analysed, which was different. This finding does not mean that joint resources do not play a major role in the success of diversified farms to the contrary they actually underline the importance of joint resources. Alsos and Carter (2006) stress that joint use of agricultural resources for non-farm ventures might have both positive and negative effects.

Learning and financial success

In chapter 3 it was hypothesized that: *'those diversified farms that: gather, share and process information efficiently in their decision-making are more successful than the others'.* This theoretical hypothesis is based on the theories of learning enterprise and decision-making. Learning enterprise is a practical approach: on studying how information is gathered, shared and used in decision-making. The analysis was mainly descriptive and explorative.

In this part of the study different ways of gathering, sharing and processing were analysed by using explorative factor analysis. According to the data obtained in this study, their effect on financial success might be delayed. These data further suggest that in the contexts of diversified-farms and also small business, learning and knowledge sharing have indirect effects on financial success through the use of other resources. In the analyses, the correlations between success variables, different resources knowledge gathering, sharing and processing were compared. The key finding in this part of the study was the crucial importance of sharing ideas in decision-making; based on the number of decision-makers that correlated positively with most of the tested resource variables. The finding is in line with the earlier findings of Krabuanrat and Phelps (1998). According to their study, feedback and learning are very important in the situations where decisions must be made in dynamic environments. Similarly, Atherton (2003) stresses that in a

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small business context the entrepreneur-manager's ability to learn is one of the most critical factors for success when a firm grows and develops. The data of Andrews and Delahaye (2000) highlight that processes that associate with knowledge circulation and sharing are reflective processes. Moreover, knowledge is distributed actively and personally. Knowledge within the organisation is often transferred, though not through official channels. In other words, critical information is passed onto those individuals who are seen as competent and trustworthy. One can conclude that the same applies to diversified farms, in relation to active learning, knowledge-gathering, sharing and processing procedures. Furthermore, trustworthy persons with whom the ideas and decisions can be discussed can also be viewed as a very important critical resource of the farm.

Capital and labour constraints; over-diversification

One of the downsides of diversification might be the phenomenon of over-diversification, which can be defined as the situation in which a farm diversifies beyond its optimal limit. Hence, diversification starts to have negative effects on profitability and a firm's market value (Markides 1995). The theoretical hypothesis was formulated as: '*over-diversification might affect a farm's success negatively; 'over-diversified farms are less successful than their non-diversified counterparts'*. The key findings of this part of the study were: 1) capital and labour constraints are an existing phenomenon and there are different types of problems; 2) it is often only temporary phase and 3) it negatively affects the financial success of the farm.

Both datasets (2001 and 2006) were analysed by using k-means cluster analysis. The groupings were made using two key resource variables: capital and labour. Similarly groupings of four: 1) 'No problems', 2) 'Problems with labour', 3) 'Problems with capital', 4) 'capital and labour resource constrained' farms were found in two datasets. Most farms, (60% 2001 data and 57% 2006 data), reported some problems with resource allocation (although clearly 'capital and labour resource constrained' farms were in a minority (18% for 2001 and 16% for 2006 data). Panel data indicated that 'capital and labour resource constrains are a temporary phase and not a lasting state.

In theory, the disadvantages of over-diversification should adversely manifest in a farm's performance, i.e. over-diversified firms should turn in weaker performances than their normal counterparts. There are some alternative explanations for the causes of resource constrains. Consider a farm that has been using its resources very efficiently and experiencing only a temporary shortage of a critical resource, while achieving business growth. Such constrained growth can be viewed as growing phase and that farm will achieve more success later (Ebben and Johnson 2006, Adizes 1988). The empirical findings of this study support the concept that at least some diversified farms are indeed over-diversified. In both datasets, 'capital and labour resource constrained' and farms with capital problems were less successful in terms of their economic indicator results. Similarly, the 'no problems' and 'labour problems' groups were more successful in terms of their economic performances. Finally, it was investigated whether capital and labour resource constrains had lasting effects. Success variables of 2006 data were tested, but the comparative grouping variable was obtained from the 2001 dataset. The evidence indicates that farms that were either 'capital and labour resource constrained' or had problems with capital 2001, were still less profitable than their 'no problems' counterparts five years later. This suggests that at least some of capital and labour resource constrained farms can be viewed as over-diversified. These findings also suggest that there are different types of problems that are caused by resource constrains. Those farms that had problems with a lack of labour were in a different situation to those who had problems with a lack of capital. The former were more successful in economic terms than the latter. That resource constrain are mostly a temporarily phenomenon and that there are different kinds of problems, indicate over-diversification might somehow be linked to the life-cycle of the enterprise. For instance, if there is a lack of labour, a farm's growth might be restricted. Managerial actions to fix this situation are therefore different from farms that have problems with a lack

of capital. Over-diversification should be taken account when diversification is planned or other big strategic decisions concerning diversification are made. In addition, one should note, that the growth dimension is not taken into account in this study. In future studies growth and resource constraints should also be specifically studied.

6.2 Managerial and policy implications

This study has stressed the importance that the effects of tangible and intangible resources have on financial success. It is self-evident that, as most diversified farms are micro businesses, they are influenced by many external factors. These external factors are often caused by big changes in society or markets that individual small businesses can not influence. However, results of this study indicate, that the success of diversified farms also depend on the different tangible and intangible resources they have. On farm resources can actually be influenced at least to some degree by farmers. Resource-based thinking gives a good footing when new directions for an individual farm can be developed. For example, considering what to do with a farm's current resources and what other resources should be created and made available in order to make profitable changes.

One of the key findings of this study was that the entrepreneur's management and professional skills play a major role in achieving success. These skills have direct and indirect causal relationships for a farm's success. In addition, sharing and processing information with other decision-makers have impacted on other resources and on the level of success. In the light of these results, skills could be one factor that a farmer could focus on in order to create a competitive advantage. As his/her managerial and professional skills grow, it is also possible to take advantage of major changes and it is also easier to adjust to the changes. Thus, investment into human capital, professional and managerial skills will most probably pay off, although as all investments this has its opportunity costs.

Over-diversification is a problematical situation, and farmers should be aware of it. It has effects on financial success, though one must also take into account the other factors as well. During the past years there have been increasing concerns about farmers' well-being. Many of them are over-burdened with work or even 'burned-out' with work and other demands. Diversification also always presents a risk for a business and therefore one should think beforehand about different solutions for dealing with these problems when they arise. For instance, using contractors and outsourcing might be ways to reduce work-load.

On a policy level, diversification can be seen as an opportunity to create new enterprises in rural areas. However, diversification is sometimes not taken into account in policy-making. For instance, farm diversification in Finland is not considered at the national level in rural or agricultural policy-making. On the other hand, diversification has been recognised and actively promoted at the local (Vihinen et al. 2007) and regional levels (Lapin Liitto 2005) in Finland. Farm diversification is one option that seems to be especially suitable for Finnish rural areas, and therefore it should be considered at a more national level. This study emphasizes that increasing skills has a clear positive impact on the overall success of a farm and that good skills give entrepreneurs the tools to develop an enterprise successfully. In an English study (Turner et al. 2006) it was found that at the time of diversifying into a business 55 per cent of farmers knew little or nothing about the business into which they were diversifying. Moreover, 67 per cent had no training in the field of specialisation of the enterprise in which they had set up. There was also a lack of interest in training in general among the diversifying farmers. However, those farmers who had received grants participated more actively in training. Unfortunately, similar data are not available from Finland but there is no reason to believe that situation was significantly different to that in England. Increasing the possibility to train oneself would be one concrete policy measure that would enhance opportunities for diversified farms. Mentoring is one possibility on give farmer a possibility to discuss their ideas and get feedback from more

experienced entrepreneurs. For instance Finnish Farmers Union (MTK 2006) have had recently a programme concerning mentoring in farms, but it is not commonly used procedure. Mentoring and other similar approaches would give valuable feedback for the diversified farm business manager/ owners and help them to enhance their most valuable resource i.e. their skills and knowledge.

6.3 Limits of the study and suggestions for future research

This study has some limitations that should be taken into account when results are interpreted. First, they cannot be generalised for the whole population of diversified farms, because the samples used in this study focused on bigger farms. However, it can be assumed that the outcomes that have come to light during the analysis also exist for real-life decision-making. Many important topics, especially those that are related to general and joint resources are cross sectional. Thus it can be assumed that outcomes could be obtained in panel data.

Second, adding a more questions to the questionnaires could have increased the reliability of individual confirmatory constructs particularly as some constructs in this study have limited robustness. However, the summate scales that were based on confirmatory factor analysis were used to measure certain abstract factors, because they were more reliable than single measurements. In future studies therefore, basic resources and knowledge will be evaluated with greater reliability by using more questions.

During this study a number of new research questions and needs for future studies arose. As has been stated above; the term, 'success' can be defined in many different ways. In this study important aspects of survival, perceived success, or growth were not taken into account. It would also be important to study these different dimensions. For instance, to explore further which kinds of resource could enhance farms' performances for different dimensions.

It would also be very informative to study this particular issue by making comparative studies between diversified farms and competing non-diversified farms within same industrial category. This kind of approach could give new insights into the advantages/disadvantages of the use of joint-resources and the possible competitive advantages. In addition more objective panel data, such as farm bookkeeping records from diversified farms would give valuable insights for the measurement of success, resources and any causal relationships between them. Positioning RBT relative to evolutionary economics would be expected to give new insights regarding diversification strategy among farms. Finally, the link between business growth and over-diversification should be explored.

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SELOSTUS

Monialaisen tilan menestyminen – resurssipohjainen analyysi

Leena Rantamäki-Lahtinen

MTT (Maa- ja elintarviketalouden tutkimuskeskus) Taloustutkimus

Maaseutuyritysten ja erityisesti maatilojen toimintaympäristö on muuttunut viime vuosina nopeasti. Maailmankaupan vapautuminen, maatalouden uusi kilpailutilanne ja nopea rakennemuutos sekä politiikkamuutokset vaativat maatiloilta yhä parempaa kilpailukykyä ja tehokkuutta. Lisäksi yhteiskunta asettaa tuotteiden ja palveluiden ekologiselle ja eettiselle kestävyydelle yhä suurempia vaatimuksia, jotka myös vaikuttavat maaseutuyritysten toimintaympäristöön. Toisaalta maaseudun tuotteille ja palveluille, kuten lähiruualle, bioenergialle ja elämysmatkailulle, on muodostunut kasvavissa määrin uutta markkinavetoista kysyntää. Maatiloilla yksi tapa vastata muutokseen on perustaa tilalle muun toimialan yritystoimintaa eli monialaistaa toimintaa. Ilmiö ei ole uusi. Viimeksi kuluneiden kymmenen-viidentoista vuoden aikana maatilojen monialaistaminen on kuitenkin merkittävästi yleistynyt niin Suomessa kuin muuallakin Euroopassa.

Monialaisen tilan, tai minkä tahansa pienen monialayrityksen, menestyksekäs johtaminen on hyvin haastavaa. Suuri osa monialaisten tilojen tutkimuksesta on kohdentunut viljelijäperheen toimentulon ja muun yritystoiminnan aloittamisvaiheen tarkasteluun. Tutkimusta eri toimialojen resurssien hyödyntämisestä, yritys-maatila kokonaisuuden johtamisesta ja menestymiseen vaikuttavista tekijöistä ei ole vielä olemassa kovinkaan paljon tutkittua tietoa. Tämän tutkimuksen päätavoitteena on tarkastella resurssien kohdentamisen ja yrityksen menestymisen välistä suhdetta monialaisilla tiloilla liiketaloustieteen näkökulmasta. Tavoitteena on tarkastella miten aineettomien ja aineellisten resurssien kohdentaminen ja mahdollinen yhteiskäyttö vaikuttavat yrityksen menestymiseen. Tutkimuksen päätavoitteen rinnalle on asetettu seuraavat alaongelmat:

- Mitä resursseja monialaisilla tiloilla on yleisesti käytössään, ja miten hyvin ne hyödyntävät maatalouden ja muun toiminnan yhteisiä voimavaroja
- Miten mahdolliset erot resursseissa vaikuttavat tilan taloudelliseen menestymiseen?
- Miten tiedon kerääminen, jakaminen ja prosessointi yrityksessä vaikuttaa sen taloudelliseen menestymiseen?
- Miten resurssien hajauttaminen vaikuttaa tilan taloudelliseen menestymiseen?

Näihin ongelmiin liittyen tutkimuksessa luotiin neljä teoreettista tutkimushypoteesia, jotka perustuivat aiempaan tieteelliseen keskusteluun ja tutkimuksen teoreettisiin taustaoletuksiin. Teoreettisena lähestymistapana tässä tutkimuksessa käytettiin resurssipohjaista teoriaa. Tiedon keruuta, jakamista ja prosessointia yrityksessä lähestyttiin oppiva yritys – teorian näkökulmasta. Lisäksi sovellettiin muita päätöksentekoon liittyviä lähestymistapoja soveltuvin osin.

Resurssipohjaisessa teoriassa yrityksen strategioiden, kasvun ja kehittymisen peruslähtökohtana ovat yrityksen omat, sisäiset resurssit. Resursseihin pohjautuvassa tutkimuksessa tarkastellaan pääomien, taitojen, kykyjen ja tiedon käyttöä yrityksen sisällä. Yrityksen sisäisiä resursseja on luokiteltu hyvin monin eri tavoin, esimerkiksi fyysisiin, taloudellisiin ja teknologisiin resursseihin. Yrityksen menestyminen siis riippuu pitkälle yrityksen kyvystä muuttaa olemassa olevat resurssit onnistuneeksi strategiaksi. Resurssipohjainen lähestymistapa on hyvin sovellettavissa monialaisten maatilojen tarkasteluun. Maatiloilla on paljon heterogeenisiä resursseja, kuten raaka-aineita, koneita, rakennuksia ja osaamista, joita voidaan hyödyntää uusilla tavoilla muussa yritystoiminnassa. Tiloilla harjoitettava muu yritystoiminta voidaan siis nähdä resurssien uudelleen kohdentamisena, uusien tuotteiden, markkinoiden ja tätä kautta kilpailuedun hakemisena. Toisaalta erityyppisten resurssien siirto toimialalta toiselle voi olla vaikeaakin. Ylihajauttamisella tarkoitetaan tilannetta, jossa yritys hajauttaa voimavaransa liian laajasti, jolloin ne pirstaloituvat.

Yksi keskeisimmistä aineettomista voimavaroista on oppiminen. Oppivalla yrityksellä tarkoitetaan kokonaisuutta, jolla on kapasiteettia oppia tehokkaasti ja siten menestyä. Saatavilla olevan tiedon määrän kasvu ja pirstaloituminen sekä tiedon leviämisen nopeus luo uusia haasteita ja mahdollisuuksia yrityksille. Yritysten ja muiden organisaatioiden kannalta on keskeistä oikeiden asioiden nopea omaksuminen ja hyödyntäminen, ja tätä asiaa voidaan myös pitää keskeisenä resurssina.

Monialaistamista voidaan pitää strategisena tapana hankkia niukoilla resursseilla taloudellista voittoa tai tapana sovittaa yrityksen käytössä olevia resursseja vallitseviin markkinaolosuhteisiin. Tutkimuksen teoreettisessa viitekehyksessä resurssit jaettiin hallinnollisiin ja tuotannollisiin resursseihin. Viitekehyksessä monialaisen tilan viljelijää ohjaa hallinnollisten resurssien, eli perheen verkostojen, ammatillisten ja liikkeenjohdollisten taitojen, avulla muita aineettomia ja aineellisia voimavaroja. Nämä erilaiset resurssit vaikuttavat suoraan ja epäsuorasti yrityksen taloudelliseen menestymiseen. Resurssien yhteiskäytön avulla monialaiset yritykset voivat pyrkiä hankkimaan skaalaetuja. Oppiminen ja tiedon prosessointi ovat yrityksen johtamisen kannalta keskeisiä toimintoja, jotka vaikuttavat päätöksentekoon. Hajauttamisen optimaalinen taso parantaa yrityksen taloudelliseen menestymistä.

Empiirisessä osassa hyödynnettiin rakennettua teoreettista mallia ja rakennettuja neljää teoreettista hypoteesia. Tutkimus tehtiin kvantitatiivisella tutkimusotteella soveltaen mm. monimuuttujamenetelmiä (faktori-, ryhmittely- ja erotteluanalyysi) ja rakenneyhtälömalleja. Tutkimuksessa käytettiin kahta postikyselyaineistoa: 1) vuonna 2001 kerättyä postikyselyaineistoa (N= 663), sekä vuonna 2006 kerättyä seuranta-aineistoa (N = 433), josta osa oli kerätty paneeliaineistona ja osa täydentävänä poikkileikkausaineistona. Suurin osa analyyseistä nojautui kuitenkin vuoden 2006 aineistoon, sillä vuoden 2001 aineistossa oli vain joitakin resursseihin liittyviä kysymyksiä.

Taloudellista menestymistä ja keskeisiä resursseja mitattiin summamuuttujilla. Näiden summamuuttujien rakentaminen tehtiin konfirmatorisen faktorianalyysin avulla. Summamuuttujien käyttö lisää tulosten luotettavuutta, kun mitattavaa kohdetta tarkastellaan useamman muuttujan avulla. Vuoden 2006 aineistossa menestymistä mitattiin kahdella summamuuttujalla, joista ensimmäinen kuvaa lyhyen tähtäimen menestymistä objektiivisilla mittareilla (nettovoitto vuosina 2003 ja 2006, kannattavuus suhteessa muihin) ja toinen pidemmällä tähtäimellä ja subjektiivisesti mitattuna (onnistuminen voiton maksimoinnissa, paremman elintason saavuttamisessa ja kannattavuudessa). Jälkimmäistä mittaria käytettiin suurimmassa osassa analyysejä. Vuoden 2001 aineistossa menestymistä mitattiin yhdellä summamuuttujalla, joka rakennettiin vastaavaksi kuin 2006 mittari. Tilan resursseja mittaavia summamuuttujia oli kolme: yrittäjäperheen taidot (ammatilliset ja liikkeenjohdolliset), perusresurssit (pääoma, tekniikka, rakennukset) sekä lopputuotteeseen liittyvät resurssit (yrityksen imago, tuotteiden/palvelujen laatu, asiakassuhteet).

Tutkimuksen empiiriset tulokset tukevat teoreettisessa viitekehyksessä esitettyjä asioita. Monialaiset tilat ovat hyvin heterogeenisia sekä menestymisensä, että käytettävissä olevien resurssiensa suhteen. Polkumallilla tehdyssä analyysissa menestymisen ja yrityksen resurssien välillä oli kausaalinen suhde. Erityisen tärkeitä voimavaroja yrityksen kannalta ovat yrittäjän liikkeenjohdolliset ja ammatilliset taidot, sillä ne linkittyvät menestymiseen sekä suoraan, että epäsuorasti muiden resurssien käytön kautta.

Ensimmäisenä teoreettisena tutkimushypoteesina oli oletus siitä, että ne monialaiset tilat, joilla oli käytössään

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riittävästi resursseja suhteutettuna kilpailijoihin myös menestyvät paremmin kuin ne tilat, joilla resursseja ei ole riittävästi. Tulosten mukaan taloudellisesti menestyneillä tiloilla oli yleisesti käytössään paremmin voimavaroja kuin heikosti menestyneillä. Tulokset siis tukevat teoreettista mallia; menestymistä mittaavat muuttujat linkittyivät yrityksen aineellisiin perusresursseihin ja yrittäjän taitoihin, jotka nähtiin hallinnollisena resurssina. Teoriasta poikkeava havainto oli se, että lopputuotteeseen liittyvillä resursseilla ei ollut kausaalisuhdetta tilan menestymiseen. Tämä voi osittain johtua siitä, että analyysi rajoittui poikkileikkausaineistoon. Toisaalta yrittäjätaidoilla oli iso vaikutus lopputuotteeseen liittyviin resursseihin. Tulosten mukaan niillä yrittäjillä, joilla on hyvä ammatillinen ja liikkeenjohdollinen osaaminen, myös tuotteen/palvelun laatu, asiakassuhteet ja yrityksen imago olivat korkealla tasolla. Kolmanneksi, lopputuotteeseen liittyvät resurssit liittyvät keskeisesti erilaistamiseen ja tuotteen laadulla kilpailemiseen. Aineiston yrityksistä ne monialaiset tilat, jotka pystyivät vastaamaan hinta- tai laajentumiskilpailuun, olivat myös menestyneet paremmin kuin muut ja niillä oli yleisesti käytössään keskimääräistä paremmat resurssit. Suurin osa yrittäjistä arvioi, että pystyy vastaamaan laatukilpailuun, mutta vastaavaa yhteyttä laadun ja menestymisen osalta ei löytynyt. Voidaankin arvioida, että vain harva monialainen tila on onnistunut erilaistamaan tuotteitaan/palvelujaan niin, että saa laadusta myös paremman hinnan. Tuloksissa korostuvat yrittäjien liikkeenjohdollisen ja ammatillisen osaamisen tärkeys. Kausaalisuhde resurssien ja menestymisen välillä ei luonnollisesti ole ainoa yrityksen menestymistä selittävä tekijä, esimerkiksi toimialan tai toimintaympäristön muutokset voivat vaikuttaa yrityksen menestymiseen. Nämä ulkoiset tekijät on kuitenkin tässä tutkimuksessa rajattu tarkastelun ulkopuolelle. Tulosten perusteella voidaan kuitenkin arvioida, että ne yrittäjät, joiden osaamistaso on korkea, pystyvät paremmin reagoimaan tapahtuviin muutoksiin, hyödyntämään olemassa olevia voimavaroja ja tekemään hyviä päätöksiä. Yrittäjien taidot ja osaaminen tulisikin nähdä kriittisinä aineettomina resursseina, joita voidaan myös tietoisesti pyrkiä parantamaan.

Toisena teoreettisena tutkimushypoteesina oli oletus siitä, että käyttämällä toimialojen yhteisresursseja monialainen tila voi saada käyttöönsä tarvittavia resursseja, ja näin menestyä paremmin. Teoriassa yhteisresurssien käytöllä voi olla kahdenlaisia vaikutuksia tilan menestymiseen. Ensinnäkin se voi vaikuttaa suoraan menestymiseen siten, että saavutetaan skaalaetuja, kustannukset alenevat ja taloudellinen tulos paranee. Toisaalta yhteisresurssien käytöllä voi olla epäsuora positiivinen vaikutus menestymiseen siten, että yrityksen käytössä olevat yleiset resurssit kasvavat. Yhteiskäyttö voi myös haitata, sillä tietyn resurssin käyttötarpeet voivat kumuloitua liian suuriksi, jolloin resurssin käytöstä tulee pullonkaula, joka hidastaa koko yrityksen kehittymistä. Lähes kaikki tähän tutkimukseen osallistuneet tilat käyttivät yhteisiä resursseja maataloudessa ja muussa toiminnassa, resurssien yhteiskäyttö on siis käytännössä hyvin yleistä. Aineiston muuttujat olivat siis hyvin vinoja tältä osin, mikä rajoitti niiden tilastollista käyttöä. Ei-parametrisilla menetelmien avulla tehtyjen analyysien mukaan yhteisresurssien käytöllä on vaikutus yleisiin resursseihin ja niillä on näin ollen epäsuoraa positiivista vaikutusta yrityskokonaisuuden menestymiseen. Tulosten mukaan yhteiskäytöllä oli vain vähän suoraa vaikutusta menestymiseen, kun monialaisia tiloja verrataan toisiinsa.

Kolmannessa teoreettisessa hypoteesissa tuotiin esiin oppiva yritys-näkökulmaa. Keskeisenä teoreettisena oletuksena oli, että sellaiset monialaiset tilat, joissa tietoa kerätään, jaetaan ja prosessoidaan tehokkaasti päätöksenteon tueksi, ovat muita menestyneempiä. Tulosten mukaan tiedonkeruun ja oppimisen vaikutukset yrityksen taloudellisen menestymisen osalta näkyvät viiveellä ja osittain epäsuorasti resurssien käytön kautta. Osion keskeinen tulos oli se, että ideoiden jakaminen ja yhdessä työstäminen ovat erittäin tärkeitä myös taloudellisen menestymisen näkökulmasta. Se, että yrittäjällä on lähipiirissään luotettavia henkilöitä, joiden kanssa voi työstää ideoita ja päätöksiä eteenpäin, voidaan nähdä hyvin tärkeänä ja kriittisenä aineettomana resurssina yrityksen johtamisen näkökulmasta.

Neljäntenä teoreettisena hypoteesina esitettiin oletus siitä, että ylihajauttaneet monialaiset yritykset menestyvät huonommin kuin muut monialaiset yritykset. Keskeiset tutkimustulokset tukivat teoreettista perusoletusta. Ryhmittely- ja erotteluanalyysin avulla monialaiset tilat jaettiin sekä vuoden 2001 aineistossa, että vuoden 2006 neljään luokkaan: 1) työn ja pääoman ylihajauttaneisiin, 2) yrityksiin, joilla oli pääoman riittävyyden suhteen ongelmia, 3) yrityksiin, joilla oli työvoiman riittävyyden kanssa ongelmia ja 4) yrityksiin, joilla ei ollut ongelmia pääomien tai työvoiman riittävyyden suhteen. Tulosten mukaan ylihajauttamiseen liittyviä ongelmia on osalla yrityksistä. Vuoden 2001 aineiston yrityksistä 18 % voitiin luokitella ylihajauttaneiksi, ja vastaavasti vuoden 2006 yrityksistä 14 % oli ylihajauttaneita. Niissä yrityksissä, joissa oli ylihajauttamiseen liittyviä ongelmia, myös osaamisen riittävyys koettiin ongelmallisemmaksi kuin muissa yrityksissä. Toinen merkittävä havainto oli, että ylihajauttaminen heikentää yrityksen kannattavuutta ja vaikuttaa siis heikentävästi yrityksen taloudelliseen

menestymiseen. Paneeliaineiston tarkastelun avulla havaittiin, että ilmiö on yleensä väliaikainen; lähes kaikki vuonna 2001 ylihajauttaneista tiloista oli siirtynyt toiseen luokkaan vuonna 2006. Väliaikaisuudestaan huolimatta ylihajauttaminen heikentää yrityksen menestymistä myös pidemmällä tähtäimellä. Ne yritykset, jotka vuonna 2001 oli luokiteltu ylihajauttaneiksi, kannattavat vielä 2006 heikommin kuin muut. Ylihajauttamisilmiön väliaikaisuus, ja se että siihen liittyvät ongelmat ovat eriasteisia, antavat viitteitä siitä, että ylihajauttamistilanne saattaa liittyä yrityksen elinkaareen. Ylihajauttamisen riski tulisi huomioida etenkin silloin kuin monialaistamista maatalouden ulkopuolelle vasta suunnitellaan tai muita vastaavia isoja strategisia päätöksiä ollaan tekemässä.

Johtopäätöksenä voidaan todeta, monialaisilla tiloilla yrityksen aineettomilla ja aineellisilla voimavaroilla on tärkeä merkitys yrityksen menestymisen kannalta. Monialaisen tilan viljelijä voi, ainakin jossain määrin, vaikuttaa yrityksensä kehittymissuuntaan ohjaamalla tilansa resurssien käyttöä. Tutkimuksen keskeinen havainto oli se, että yrittäjän/yrittäjien liikkeenjohdollinen ja ammatillinen osaaminen ovat avainasemassa yrityksen menestymisen näkökulmasta. Toinen keskeinen havainto koski tiedon jakamisen ja prosessoinnin tärkeyttä; se, että yrittäjällä on joku, kenen kanssa ”sparrata” ajatuksiaan, on keskeistä myös taloudellisen menestymisen näkökulmasta. Tulosten valossa näyttää siltä, että monialaisten tilojen viljelijöiden kannattaa panostaa erityisesti osaamisen kehittämiseen ja henkisen pääoman kasvattamiseen. Kun yrittäjän liikkeenjohdolliset ja/tai ammatilliset taidot kasvavat, hänen on helpompi sopeuttaa toimintaa toimintaympäristön muutoksiin ja myös hyödyntää muutoksen avaamat mahdollisuudet.

Monialaisuus on Suomessa yleisempää kuin suurimmassa osassa muuta Eurooppaa. Monialaisuus omalta osaltaan tukee maaseudun yrittäjyyttä ja tukee näin maaseudun elinvoimaisuutta. Yksi konkreettinen politiikkatoimi, jonka avulla monialaisten tilojen kilpailukykyä yleisellä tasolla voisi parantaa, on tarjota monialaisten tilojen viljelijöille koulutusta ja välineitä kehittää osaamistaan. Esimerkiksi mentoroinista on muutamia lupaavia esimerkkejä ja sen tyyppinen toiminta voisi tukea yrittäjiä erilaisissa päätöksentekoon liittyvissä tilanteissa.

Jatkotutkimuksissa tulisi kiinnittää erityistä huomiota menestymisen erilaisiin näkökulmiin ja mittaamistapoihin. Tässä tutkimuksessa esimerkiksi yrityksen kasvun, selviytymisen tai elämäntapayrittäjyyteen liittyvää subjektiivista menestymistä ei huomioitu lainkaan, jatkossa näitä teemoja olisi tärkeää selvittää. Erityisen tärkeää olisi kartoittaa ylihajauttamisen liittymistä yrityksen kasvuun ja tilan elinkaaren vaiheeseen. Lisäksi objektiivinen talousaineisto, kuten kirjanpitotila-aineisto, voisi tuoda lisää arvokasta tietoa taloudellisesta menestymisestä ja resursseista, sekä näiden välisistä suhteista. Resurssipohjaisen teorian linkittäminen evoluutiotalousteoreettiseen viitekehykseen voisi tuoda uusia näkökulmia monialaisuuden esiintymiseen maatiloilla. Jatkossa tutkimuksissa olisi tärkeää myös vertailla monialaisten tilojen ja erikoistuneiden yritysten välisiä eroja.

Appendix 1

Appendix 1. The 2001 questionnaire; variables used in this study

Background variables of the respondent

- Year of birth
- Sex
- Education:
  No education/Short courses/vocational professional education/Further education/University level education
- Years of experience as entrepreneur

Background variables of the diversified farms

- Year when respondent had started/taken over the business
- The share (%) of the family's net income from that enterprise at 2001
- The share (%) of the family's net income from agriculture at 2001
- Sales of non-agricultural activity at 2001
  1) less than 50 000 FIM, 2) 50 000 to 99 000 FIM, 3) 100 000 to 249 000 FIM, 4) 250 000 to 499 000 FIM, 5) 500 000 to 1000 0000 FIM, 6) over 1 million to 5 million, 7) 5 million to 10 000 million, 8) over 10 million FIM
- Turnover from farming at 2001
  1) less than 50 000 FIM, 2) 50 000 to 99 000 FIM, 3) 100 000 to 249 000 FIM, 4) 250 000 to 499 000 FIM, 5) 500 000 to 1000 0000 FIM, 6) over 1 million
- Personnel, non-agricultural activity at 2001
  1) less than 1, 2) 1 to2, 3) from 2 to 5, 4) from 5 to 10, 5) from 10 to 15, 6) from 15 to 20, 7) over 20
- Personnel, agriculture 2001
  1) less than 1, 2) 1 to2, 3) from 2 to 5, 4) from 5 to 10, 5) from 10 to 15, 6) from 15 – 20, 7) over 20
    - Investments to non agricultural activity 2001

  1) less than 50 000 FIM, 2) from 50 000 to 149 000 FIM, 3) from 150 000 to 499 000 FIM, 4) from 500 000 to 999 000 FIM, 5) 1 million or more
- Investments to non agriculture 2001
  1) less than 50 000 FIM, 2) from 50 000 to 149 000 FIM, 3) from 150 000 to 499 000 FIM, 4) from 500 000 to 999 000 FIM, 5) 1 million or more

Variables used for defining financial success

- Net profit for 1999,
  on a scale of 1 to 5, where 1 is 'notably unprofitable' and 5 is 'satisfyingly positive
- Net profit for 2001,
  on a scale of 1 to 5, where 1 is 'notably unprofitable' and 5 is 'satisfyingly positive
- The development of profitability from 1997 to 2000,
  was scored on a scale of 1 to 5, where 1 means that profitability has weakened significantly and 5 that profitability has been significantly enhanced

Variables determining information gathering, sharing and success

- Are you a member of the farmers union? (0 = no, 1 = yes)

Appendix 1

- Are you a member of the Federation of Finnish Enterprises member of its local branches? (0 = no, 1 = yes)
- Are you a member of some other entrepreneurial association? (0 = no, 1 = yes)
- How often do you participate in the events that are intended for entrepreneurs (exhibitions, seminars, training courses)? (0 = Never/less than once a year, 1 = 1 to 2 times a year, 2 = Few times a year and 3 = at least once a month)
- How often do you read newspapers and magazines that are aimed at entrepreneurs? (0 = never, 1 = occasionally, 2 = at least once a month, 3 = at least once a week or more often)
- Do you read literature that is aimed at entrepreneurs? (0 = no, 1 = yes)
- With how many people you discuss matters that are related to your enterprise every week? (1 = no-one, 2 = one person, 3 = 2 to 3 persons, 4 = 4 to 10 persons, 5 = more than 10 persons)
- Do you have contact to a person with whom you can confidentially and openly discuss all possible matters related to your enterprise (0 = no, 1 = yes)

Variables determining over-diversification

- We have enough labour for farming and other businesses
  1 = strongly disagree, 5 = strongly agree

- We have enough capital for both farming and other businesses
  1 = strongly disagree, 5 = strongly agree

Appendix 2

Appendix 2. The 2006 questionnaire; variables used in this study

Background variables of the respondent

- Year of birth
- Sex
- Education:
  No education/Short courses/vocational professional education/Further education/University level education
- Years of experience as an entrepreneur

Background variables of the diversified farms

- Year when respondent had started/taken over the business
- The share (%) of the family's net income from that enterprise in 2006
- The share (%) of the family's net income from agriculture in 2006
- Sales (EUR) of the whole diversified farm at 2006
- Turnover /EUR) from farming 2006
- Personnel, whole diversified farm 2006, man-years
- Personnel, agriculture only 2006, man years
- Investments (EUR) into the whole diversified farm 2006
- Investments (EUR) into non agricultural enterprises 2006, EUR

Variables used for defining financial success

- Profit maximising (question 30F)
  Likert type scale scoring from 1 to 5 (1 = not at all, 5 = very well)
- Achieving a better standard of living for me and my family (question 30J)
  Likert type scale scoring from 1 to 5 (1 = not at all, 5 = very well)
- Economic profitability of the entrepreneurial functions (question 30H).
  Likert type scale scoring from 1 to 5 (1 = not at all, 5 = very well)

- Net profit at 2003,
  a scale from 1 to 5, where 1 is 'notably unprofitable' and 5 is 'satisfyingly positive'
- Net profit at 2006, on same scale as the previous question
- The development of profitability from 2002 to 2005,
  a scale 1 to 5, where 1 means that profitability has significantly weakened and 5 that profitability has been significantly enhanced
- Relative profitability compared to enterprises in the same sector,
  a scale 1 to 5 where 1 means that the profitability is significantly weaker and 5 that profitability is significantly better.

Variables used for defining resources

- Own resources compared to competitors.
  All on scale 1 to 5, 1 = significantly weaker; 3 = similar; 5 = significantly better
  - Raw materials

Appendix 2

- Technology, machinery
- Buildings, area, etc.
- Capital
- Labour
- Innovative products/services
- Management skills
- Farm's image
- Customer relationships
- Professional skills
- Co-operation and networks
- Quality of the products/services
- Logistical systems

- Are you facing this kind of competition?
  All on scale from 1 to 4; where 1 equals 'not at all and 4 'extremely high'.
  - Price competition
  - Quality competition
  - Expansion competition

- How well can you compete in these different types of situations ?
  All on a scale from 1 to 4; where1 equals 'not at all, and 4 'very well'
  - Price competition
  - Quality competition
  - Expansion competition

Variables used for defining joint resources

- How much do you utilise your own farm's resources in your other entrepreneurial activities?
  All on scale from 1 to 5; where 1 equals to 'not at all' and 5 'very much'
  - Raw materials and by-products of agriculture
  - Machinery and equipment of farm
  - Farm buildings, areas, animals etc.
  - Farm labour
  - Farming know-how
  - Farm as the source of financing of non-farm activity: collateral and cash-flow financing
  - Farm contacts and networks
  - Forestry

- How much do you utilise the resources of your non-agricultural entrepreneurial activities in your farming?'
  All on scale from 1 to 5; where 1 equals 'not at all' and 5 'very much'

  - Products and by-products of non-farm activity
  - Non-farm machinery and equipment
  - Non-farm buildings, areas
  - Non-farm labour
  - Non-farm know-how
  - Non-farm activity as a source of financing for agriculture: collateral and cash-flow financing

Appendix 2

- Non-farm Contacts and networks

Variables determining information gathering, sharing and success

- How important for your enterprise are the following ways of information gathering and learning? Think of all the persons working for the enterprise.
  Scale from 1 to 5; where 1 = not at all, 5 = very important
  - Advice given by municipality level authorities
  - Advice given by other authorities (employment and economic development centres)
  - Advisory services (ProAgria etc.)
  - Vocational school
  - Professional books (reports, manuals)
  - Professional and trade newspapers
  - Personal contacts to other entrepreneurs
  - Personal contacts to advisers
  - Common seminars and lectures to entrepreneurs
  - Internet
  - Television, radio
  - Customer surveys
  - Income statements and balance sheets
  - Tax information
  - Trial and error

- How important are the following channels to share the information?
  Scale from 1 to 5; where 1 = not at all, 5 = very important
  - 'Coffee table' conversations and other casual means
  - Via internal e-mail lists, intranet
  - Other internal information (notes on board, oral advice)
  - Internal meetings, training courses
  - Using quality handbooks and similar processes

- How many persons are involved in making short-term (less than 1 year) decisions?
- How many persons are involved of making medium term (1 to 5 years) decisions
- How many persons are involved of making long term (over 5 years) decisions

- How important it is knowledge gathering and sharing, when decisions are made in the . . .
  Scale from 1 to 3; 1 = not important, 2 = quite important, 3 = very important
  - … short term
  - … medium term
  - …. long term?

Variables determining over-diversification

All on a scale from 1 to 5; 1 = strongly disagree, 5 = strongly agree

- We have enough labour for farming and other businesses
- We have enough capital for both farming and other businesses
- We have enough knowledge for both farming and other businesses

Appendix 3. Confirmatory factor analysis for success- variables

Test for bivariate normality.

(PE=Pearson Product Moment, PC=Polychoric, PS=Polyserial)

Variable	vs.	Variable	Correlation	Test of Model Chi-Squ.	D.F.	P-Value	Test of Close Fit RMSEA	P-Value
PREL	vs.	PDEV	0.313 (PC)	17.835	15	0.271	0.022	0.905
PMAX	vs.	PDEV	0.227 (PC)	20.748	15	0.145	0.032	0.818
PMAX	vs.	PREL	0.342 (PC)	39.893	15	0.000	0.066	0.131
BLIVING	vs.	PDEV	0.224 (PC)	13.344	15	0.576	0.000	0.978
BLIVING	vs.	PREL	0.359 (PC)	18.257	15	0.249	0.024	0.894
BLIVING	vs.	PMAX	0.658 (PC)	38.194	15	0.001	0.064	0.166
SPROF	vs.	PDEV	0.276 (PC)	27.794	15	0.023	0.047	0.526
SPROF	vs.	PREL	0.438 (PC)	23.948	15	0.066	0.040	0.694
SPROF	vs.	PMAX	0.639 (PC)	26.848	15	0.030	0.046	0.568
SPROF	vs.	BLIVING	0.802 (PC)	53.187	15	0.000	0.082	0.014
PROFIT03	vs.	PDEV	0.452 (PC)	18.823	15	0.222	0.026	0.879
PROFIT03	vs.	PREL	0.535 (PC)	7.558	15	0.940	0.000	0.999
PROFIT03	vs.	PMAX	0.386 (PC)	14.130	15	0.516	0.000	0.970
PROFIT03	vs.	BLIVING	0.464 (PC)	11.903	15	0.686	0.000	0.988
PROFIT03	vs.	SPROF	0.544 (PC)	13.347	15	0.576	0.000	0.978
PROFIT06	vs.	PDEV	0.424 (PC)	7.778	15	0.932	0.000	0.999
PROFIT06	vs.	PREL	0.438 (PC)	14.506	15	0.488	0.000	0.966
PROFIT06	vs.	PMAX	0.243 (PC)	13.692	15	0.549	0.000	0.975
PROFIT06	vs.	BLIVING	0.356 (PC)	24.868	15	0.052	0.042	0.655
PROFIT06	vs.	SPROF	0.383 (PC)	18.386	15	0.243	0.024	0.891
PROFIT06	vs.	PROFIT03	0.636 (PC)	54.493	15	0.000	0.083	0.011

Covariance Matrix

	PDEV	PREL	PMAX	BLIVING	SPROF	PROFIT03
PDEV	1.00					
PREL	0.22	0.66				
PMAX	0.18	0.22	0.91			
BLIVING	0.19	0.22	0.51	0.85		
SPROF	0.23	0.28	0.49	0.60	0.83	
PROFIT03	0.30	0.29	0.23	0.27	0.34	0.68
PROFIT06	0.28	0.23	0.14	0.21	0.24	0.36

Covariance Matrix

	PROFIT06
PROFIT06	0.62

Number of Iterations = 5

LISREL Estimates (Maximum Likelihood)

Measurement Equations

PDEV = 0.48*succes_i, Errorvar.= 0.77 , R^2 = 0.23
(0.053) (0.060)
9.03 12.88

PREL = 0.46*succes_i, Errorvar.= 0.45 , R^2 = 0.32

Appendix 3

(0.042) (0.037)
10.93 12.16

PMAX = 0.64*succes_s, Errorvar.= 0.50 , R^2 = 0.45
(0.045) (0.041)
14.17 12.14

BLIVING = 0.76*succes_s, Errorvar.= 0.27 , R^2 = 0.68
(0.041) (0.033)
18.40 8.26

SPROF = 0.79*succes_s, Errorvar.= 0.20 , R^2 = 0.75
(0.040) (0.032)
19.63 6.44

PROFIT03 = 0.65*succes_i, Errorvar.= 0.25 , R^2 = 0.63
(0.041) (0.034)
15.93 7.44

PROFIT06 = 0.53*succes_i, Errorvar.= 0.34 , R^2 = 0.46
(0.040) (0.032)
13.35 10.54

Correlation Matrix of Independent Variables

	succes_i	succes_s
succes_i	1.00	
succes_s	0.59	1.00
	(0.05)	
	13.04	

succes_i 0.59 1.00

Completely Standardized Solution

LAMBDA-X

	succes_s	succes_i
PDEV	- -	0.48
PREL	- -	0.57
PMAX	0.60	- -
BLIVING	0.76	- -
SPROF	0.94	- -
PROFIT03	- -	0.79
PROFIT06	- -	0.68

PHI

	succes_s	succes_i
succes_s	1.00	
succes_i	0.59	1.00

THETA-DELTA

	PDEV	PREL	PMAX	BLIVING	SPROF	PROFIT03
PDEV	0.77					

Appendix 3

PREL	- -					0.68
PMAX	- -	- -				0.63
BLIVING	- -	- -	0.12	0.42		
SPROF	- -	- -	- -	- -	0.12	
PROFIT03	- -	- -	- -	- -	- -	0.37
PROFIT06	- -	- -	- -	- -	- -	- -

THETA-DELTA

	PROFIT06
PROFIT06	0.54

Goodness of Fit Statistics

Degrees of Freedom = 13
Minimum Fit Function Chi-Square = 21.41 (P = 0.065)
Normal Theory Weighted Least Squares Chi-Square = 21.32 (P = 0.067)
Estimated Non-centrality Parameter (NCP) = 8.32
90 Percent Confidence Interval for NCP = (0.0 ; 25.08)

Minimum Fit Function Value = 0.054
Population Discrepancy Function Value (F0) = 0.021
90 Percent Confidence Interval for F0 = (0.0 ; 0.063)
Root Mean Square Error of Approximation (RMSEA) = 0.040
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.070)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.67

Expected Cross-Validation Index (ECVI) = 0.13
90 Percent Confidence Interval for ECVI = (0.11 ; 0.17)
ECVI for Saturated Model = 0.14
ECVI for Independence Model = 3.27

Chi-Square for Independence Model with 21 Degrees of Freedom = 1276.54
Independence AIC = 1290.54
Model AIC = 51.32
Saturated AIC = 56.00
Independence CAIC = 1325.41
Model CAIC = 126.04
Saturated CAIC = 195.48

Normed Fit Index (NFI) = 0.98
Non-Normed Fit Index (NNFI) = 0.99
Parsimony Normed Fit Index (PNFI) = 0.61
Comparative Fit Index (CFI) = 0.99
Incremental Fit Index (IFI) = 0.99
Relative Fit Index (RFI) = 0.97

Critical N (CN) = 511.75
Root Mean Square Residual (RMR) = 0.024
Standardized RMR = 0.032
Goodness of Fit Index (GFI) = 0.98
Adjusted Goodness of Fit Index (AGFI) = 0.97
Parsimony Goodness of Fit Index (PGFI) = 0.46

Appendix 4. Principal component analysis

Communalities

	Initial	Extraction
PROFIT 1999	1,000	,581
PROFIT 2001	1,000	,782
Development of profitablity	1,000	,267

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1,630	54,340	54,340	1,630	54,340	54,340
2	,952	31,748	86,088			
3	,417	13,912	100,000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
PROFIT 1999	,762
PROFIT 2001	,884
Development of profitablity	,517

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Rotated Component Matrix[a]

a. Only one component was extracted. The solution cannot be rotated.

Appendix 5

Appendix 5. The comfirmatory factor analysis for resources

Test for bivariate normality.

			Test of Model			Test of Close Fit	
Variable	vs. Variable	Correlation	Chi-Squ.	D.F.	P-Value	RMSEA	P-Value
BUILD	vs. TEC	0.393 (PC)	36.343	15	0.002	0.064	0.178
CAP	vs. TEC	0.331 (PC)	13.160	15	0.590	0.000	0.973
CAP	vs. BUILD	0.316 (PC)	32.503	15	0.005	0.058	0.291
BSKILLS	vs. TEC	0.323 (PC)	24.565	15	0.056	0.043	0.623
BSKILLS	vs. BUILD	0.379 (PC)	22.319	15	0.100	0.037	0.721
BSKILLS	vs. CAP	0.352 (PC)	28.120	15	0.021	0.050	0.463
IMAGE	vs. TEC	0.283 (PC)	22.403	15	0.098	0.037	0.718
IMAGE	vs. BUILD	0.248 (PC)	34.815	15	0.003	0.061	0.218
IMAGE	vs. CAP	0.266 (PC)	25.000	15	0.050	0.044	0.603
IMAGE	vs. BSKILLS	0.487 (PC)	29.557	15	0.014	0.053	0.402
RELA	vs. TEC	0.247 (PC)	13.573	15	0.558	0.000	0.969
RELA	vs. BUILD	0.240 (PC)	21.786	15	0.114	0.036	0.743
RELA	vs. CAP	0.221 (PC)	25.106	15	0.049	0.044	0.598
RELA	vs. BSKILLS	0.483 (PC)	28.023	15	0.021	0.050	0.467
RELA	vs. IMAGE	0.603 (PC)	28.474	15	0.019	0.051	0.448
PSKILLS	vs. TEC	0.353 (PC)	36.737	15	0.001	0.064	0.168
PSKILLS	vs. BUILD	0.285 (PC)	36.846	15	0.001	0.064	0.166
PSKILLS	vs. CAP	0.270 (PC)	18.342	15	0.245	0.025	0.868
PSKILLS	vs. BSKILLS	0.509 (PC)	24.933	15	0.051	0.043	0.606
PSKILLS	vs. IMAGE	0.526 (PC)	25.233	15	0.047	0.044	0.592
PSKILLS	vs. RELA	0.539 (PC)	28.705	15	0.018	0.051	0.438
QUALITY	vs. TEC	0.232 (PC)	20.473	11	0.039	0.050	0.464
QUALITY	vs. BUILD	0.235 (PC)	20.724	11	0.036	0.050	0.451
QUALITY	vs. CAP	0.187 (PC)	15.588	11	0.157	0.034	0.721
QUALITY	vs. BSKILLS	0.423 (PC)	10.497	11	0.486	0.000	0.927
QUALITY	vs. IMAGE	0.552 (PC)	43.233	11	0.000	0.091	0.008
QUALITY	vs. RELA	0.515 (PC)	20.648	11	0.037	0.050	0.455
QUALITY	vs. PSKILLS	0.580 (PC)	14.187	11	0.223	0.029	0.789

CFA for resources

Covariance Matrix

	TEC	BUILD	CAP	BSKILLS	IMAGE	RELA
TEC	0.79					
BUILD	0.30	0.93				
CAP	0.24	0.25	0.81			
BSKILLS	0.22	0.28	0.24	0.74		
IMAGE	0.18	0.17	0.17	0.31	0.68	
RELA	0.15	0.16	0.14	0.29	0.34	0.63
PSKILLS	0.21	0.19	0.16	0.29	0.29	0.29
QUALITY	0.13	0.15	0.11	0.24	0.30	0.26

Covariance Matrix

	PSKILLS	QUALITY

Appendix 5

```
           --------   --------
PSKILLS        0.60
QUALITY        0.29       0.57


cfa for resources

Number of Iterations =  5

LISREL Estimates (Maximum Likelihood)

        Measurement Equations


TEC      = 0.53*basic, Errorvar.= 0.51  , R² = 0.35
          (0.057)                (0.055)
           9.37                   9.38

BUILD    = 0.55*basic, Errorvar.= 0.62  , R² = 0.33
          (0.061)                (0.063)
           9.08                   9.76

CAP      = 0.46*basic, Errorvar.= 0.60  , R² = 0.26
          (0.057)                (0.055)
           8.04                   10.82

BSKILLS  = 0.55*skills, Errorvar.= 0.43  , R² = 0.42
          (0.047)                 (0.041)
           11.83                   10.47

IMAGE    = 0.60*output, Errorvar.= 0.32  , R² = 0.53
          (0.043)                 (0.034)
           14.02                   9.47

RELA     = 0.56*output, Errorvar.= 0.32  , R² = 0.49
          (0.041)                 (0.032)
           13.48                   9.96

PSKILLS  = 0.53*skills, Errorvar.= 0.32  , R² = 0.47
          (0.042)                 (0.034)
           12.52                   9.56

QUALITY  = 0.50*output, Errorvar.= 0.32  , R² = 0.44
          (0.040)                 (0.030)
           12.50                   10.65
```

Correlation Matrix of Independent Variables

```
           basic      output     skills
```

Appendix 5

```
            --------   --------   --------
 basic          1.00

 output         0.54       1.00
               (0.07)
                7.85

 skills         0.77       0.95       1.00
               (0.07)     (0.05)
                11.17      20.21
```

Goodness of Fit Statistics

```
Degrees of Freedom = 17
Minimum Fit Function Chi-Square = 16.35 (P = 0.50)
Normal Theory Weighted Least Squares Chi-Square = 16.10 (P = 0.52)
Chi-Square Difference with 0 Degree of Freedom = 0.00 (P = 1.00)
Estimated Non-centrality Parameter (NCP) = 0.0
90 Percent Confidence Interval for NCP = (0.0 ; 12.59)
Minimum Fit Function Value = 0.047
Population Discrepancy Function Value (F0) = 0.0
90 Percent Confidence Interval for F0 = (0.0 ; 0.036)
Root Mean Square Error of Approximation (RMSEA) = 0.0
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.046)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.97
Expected Cross-Validation Index (ECVI) = 0.16
90 Percent Confidence Interval for ECVI = (0.16 ; 0.19)
ECVI for Saturated Model = 0.21
ECVI for Independence Model = 2.00
Chi-Square for Independence Model with 28 Degrees of Freedom = 682.93
Independence AIC = 698.93
Model AIC = 54.10
Saturated AIC = 72.00
Independence CAIC = 737.82
Model CAIC = 146.46
Saturated CAIC = 246.99
Normed Fit Index (NFI) = 0.98
Non-Normed Fit Index (NNFI) = 1.00
Parsimony Normed Fit Index (PNFI) = 0.59
Comparative Fit Index (CFI) = 1.00
Incremental Fit Index (IFI) = 1.00
Relative Fit Index (RFI) = 0.96

Critical N (CN) = 716.11

Root Mean Square Residual (RMR) = 0.017
Standardized RMR = 0.024
Goodness of Fit Index (GFI) = 0.99
Adjusted Goodness of Fit Index (AGFI) = 0.98
Parsimony Goodness of Fit Index (PGFI) = 0.47

Time used:    0.047 Seconds
```

Appendix 6

Appendix 6. Path diagram

Covariance Matrix

	SUCCES	BASIC	OUTPUT	NETWORK	SKILL
SUCCES	5.60				
BASIC	1.63	4.22			
OUTPUT	1.07	1.42	3.71		
NETWORK	0.50	0.55	0.71	0.59	
SKILL	1.05	1.33	1.66	0.45	1.88

path diagram

Number of Iterations = 3

LISREL Estimates (Maximum Likelihood)

Structural Equations

SUCCES = 0.24*BASIC - 0.022*OUTPUT + 0.41*NETWORK + 0.31*SKILL, Errorvar.= 4.70 , R² = 0.16
(0.067) (0.084) (0.18) (0.12) (0.37)
3.60 -0.26 2.21 2.56 12.79

BASIC = 0.50*NETWORK + 0.59*SKILL, Errorvar.= 3.16 , R² = 0.25
(0.14) (0.079) (0.25)
3.51 7.43 12.79

OUTPUT = 0.67*NETWORK + 0.72*SKILL, Errorvar.= 2.04 , R² = 0.45
(0.11) (0.064) (0.16)
5.85 11.39 12.79

Reduced Form Equations

SUCCES = 0.52*NETWORK + 0.44*SKILL, Errorvar.= 4.89, R² = 0.13
(0.18) (0.099)
2.92 4.43

BASIC = 0.50*NETWORK + 0.59*SKILL, Errorvar.= 3.16, R² = 0.25
(0.14) (0.079)
3.51 7.43

OUTPUT = 0.67*NETWORK + 0.72*SKILL, Errorvar.= 2.04, R² = 0.45
(0.11) (0.064)
5.85 11.39

Appendix 6

Covariance Matrix of Independent Variables

	NETWORK	SKILL
NETWORK	0.59	
	(0.05)	
	12.79	
SKILL	0.45	1.88
	(0.06)	(0.15)
	7.06	12.79

Goodness of Fit Statistics

Degrees of Freedom = 1
Minimum Fit Function Chi-Square = 0.39 (P = 0.53)
Normal Theory Weighted Least Squares Chi-Square = 0.39 (P = 0.53)
Chi-Square Difference with 1 Degree of Freedom = 4.89 (P = 0.027)
Estimated Non-centrality Parameter (NCP) = 0.0
90 Percent Confidence Interval for NCP = (0.0 ; 5.06)
Minimum Fit Function Value = 0.0012
Population Discrepancy Function Value (F0) = 0.0
90 Percent Confidence Interval for F0 = (0.0 ; 0.015)
Root Mean Square Error of Approximation (RMSEA) = 0.0
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.12)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.67
Expected Cross-Validation Index (ECVI) = 0.089
90 Percent Confidence Interval for ECVI = (0.089 ; 0.10)
ECVI for Saturated Model = 0.092
ECVI for Independence Model = 1.30
Chi-Square for Independence Model with 10 Degrees of Freedom = 415.89
Independence AIC = 425.89
Model AIC = 28.39
Saturated AIC = 30.00
Independence CAIC = 449.88
Model CAIC = 95.58
Saturated CAIC = 101.99

Normed Fit Index (NFI) = 1.00
Non-Normed Fit Index (NNFI) = 1.02
Parsimony Normed Fit Index (PNFI) = 0.100
Comparative Fit Index (CFI) = 1.00
Incremental Fit Index (IFI) = 1.00
Relative Fit Index (RFI) = 0.99

Critical N (CN) = 5600.30

Root Mean Square Residual (RMR) = 0.023
Standardized RMR = 0.0058
Goodness of Fit Index (GFI) = 1.00
Adjusted Goodness of Fit Index (AGFI) = 0.99
Parsimony Goodness of Fit Index (PGFI) = 0.067

Time used: 0.047 Seconds

Appendix 7

Appendix 7. Crosstabulations

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
How important it is knowledge gathering and sharing in short term * How important it is knowledge gathering and sharing in medium term	366	84,5%	67	15,5%	433	100,0%
How important it is knowledge gathering and sharing in short term * How important it is knowledge gathering and sharing in long term	366	84,5%	67	15,5%	433	100,0%

How important it is knowledge gathering and sharing in short term * How important it is knowledge gathering and sharing in medium term

Crosstab

			How important it is knowledge gathering and sharing in medium term			Total
			1,0	2,0	3,0	
How important it is knowledge gathering and sharing in short term	1,0	Count	31	7	3	41
		Expected Count	3,7	21,5	15,8	41,0
	2,0	Count	2	163	24	189
		Expected Count	17,0	99,1	72,8	189,0
	3,0	Count	0	22	114	136
		Expected Count	12,3	71,3	52,4	136,0
Total		Count	33	192	141	366
		Expected Count	33,0	192,0	141,0	366,0

Appendix 7

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	427,758[a]	4	,000
Likelihood Ratio	331,877	4	,000
Linear-by-Linear Association	218,950	1	,000
N of Valid Cases	366		

a. 1 cells (11,1%) have expected count less than 5. The minimum expected count is 3,70.

How important it is knowledge gathering and sharing in short term * How important it is knowledge gathering and sharing in long term

Crosstab

			How important it is knowledge gathering and sharing in long term			Total
			1,0	2,0	3,0	
How important it is knowledge gathering and sharing in short term	1,0	Count	29	6	6	41
		Expected Count	4,5	20,9	15,6	41,0
	2,0	Count	9	156	24	189
		Expected Count	20,7	96,6	71,8	189,0
	3,0	Count	2	25	109	136
		Expected Count	14,9	69,5	51,7	136,0
Total		Count	40	187	139	366
		Expected Count	40,0	187,0	139,0	366,0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	328,970[a]	4	,000
Likelihood Ratio	267,651	4	,000
Linear-by-Linear Association	171,236	1	,000
N of Valid Cases	366		

a. 1 cells (11,1%) have expected count less than 5. The minimum expected count is 4,48.

Appendix 7

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
How important it is knowledge gathering and sharing in medium term * How important it is knowledge gathering and sharing in long term	366	84,5%	67	15,5%	433	100,0%

How important it is knowledge gathering and sharing in medium term * How important it is knowledge gathering and sharing in long term Crosstabulation

			How important it is knowledge gathering and sharing in long term			Total
			1,0	2,0	3,0	
How important it is knowledge gathering and sharing in medium term	1,0	Count	31	1	1	33
		Expected Count	3,6	16,9	12,5	33,0
	2,0	Count	7	172	13	192
		Expected Count	21,0	98,1	72,9	192,0
	3,0	Count	2	14	125	141
		Expected Count	15,4	72,0	53,5	141,0
Total		Count	40	187	139	366
		Expected Count	40,0	187,0	139,0	366,0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	501,594[a]	4	,000
Likelihood Ratio	413,522	4	,000
Linear-by-Linear Association	258,510	1	,000
N of Valid Cases	366		

Appendix 7

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	501,594[a]	4	,000
Likelihood Ratio	413,522	4	,000
Linear-by-Linear Association	258,510	1	,000
N of Valid Cases	366		

a. 1 cells (11,1%) have expected count less than 5. The minimum expected count is 3,61.

Appendix 8. Factor analysis for gathering and sharing information

Communalities

	Initial	Extraction
41A Advices given by municipality level authorities	,522	,628
41BAdviced given by other authorities (employment and economic development centers	,600	,728
41CAdvisory services (ProAgria and such)	,545	,632
41EProfessional books (reports, guide books)	,504	,482
41FProfessinal newspapers	,540	,724
41G Personal contacts to other entrepreneurs	,351	,358
41H personal contacts to advisers	,400	,415
41ICommon seminars and lectures to entrepreneurs	,347	,406
41J Internet	,313	,306
41KTelevision, radio	,262	,310
41L Customer surveys	,244	,278
41M Quality handbooks and such	,491	,509
41N Income statements and balance sheets	,583	,668
41O Tax information	,538	,512
42A 'Coffee table' conversations and such	,255	,330
42B Via e-mail lists, intranet	,243	,282
42C Other internal information (notes on board, oral advices)	,428	,677
42D Internal meetings, training courses	,460	,482
42E Quality handbooks	,485	,415

Extraction Method: Principal Axis Factoring.

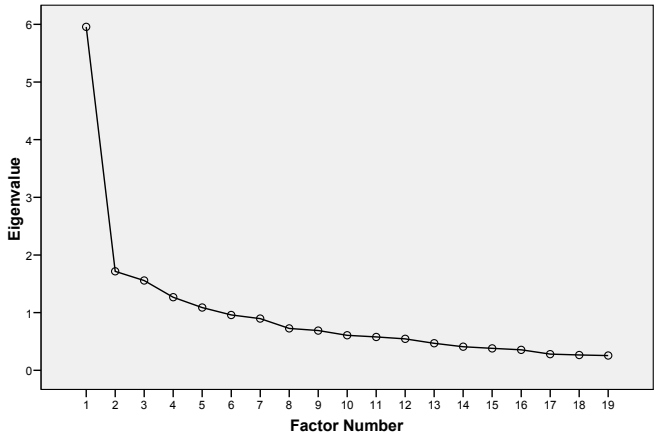
Appendix 8

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,956	31,349	31,349	5,467	28,775	28,775	2,101	11,057	11,057
2	1,716	9,033	40,382	1,277	6,719	35,494	2,037	10,724	21,781
3	1,557	8,195	48,577	1,119	5,892	41,386	1,967	10,354	32,135
4	1,268	6,672	55,249	,664	3,495	44,881	1,820	9,579	41,714
5	1,089	5,732	60,981	,614	3,233	48,114	1,216	6,400	48,114
6	,959	5,046	66,027						
7	,897	4,720	70,747						
8	,726	3,820	74,567						
9	,688	3,623	78,190						
10	,608	3,198	81,388						
11	,577	3,039	84,427						
12	,545	2,871	87,298						
13	,469	2,469	89,766						
14	,409	2,152	91,919						
15	,380	1,999	93,918						
16	,355	1,866	95,784						
17	,281	1,477	97,261						
18	,265	1,394	98,655						
19	,255	1,345	100,000						

Extraction Method: Principal Axis Factoring.

Scree Plot



Appendix 8

Factor Matrix[a]

	Factor				
	1	2	3	4	5
41N Income statements and balance sheets	,668	,163	-,012	-,370	-,242
41BAdviced given by other authorities (employment and economic development centers	,626	-,372	-,423	-,021	,138
41O Tax information	,625	,043	-,021	-,257	-,231
41CAdvisory services (ProAgria and such)	,623	-,341	-,355	,025	-,025
41M Quality handbooks and such	,593	,276	-,121	-,115	-,230
42D Internal meetings, training courses	,581	,352	-,079	,007	,119
41H personal contacts to advisers	,569	-,126	-,025	,246	-,117
42C Other internal information (notes on board, oral advices)	,554	,404	-,034	-,041	,453
42E Quality handbooks	,538	,268	-,212	-,072	-,064
41A Advices given by municipality level authorities	,535	-,486	-,267	-,010	,187
41ICommon seminars and lectures to entrepreneurs	,528	-,085	,144	,248	-,195
41G Personal contacts to other entrepreneurs	,520	-,046	,279	-,013	,082
41EProfessional books (reports, guide books)	,512	-,202	,417	-,066	,020
41KTelevision, radio	,458	,088	-,001	,297	-,063
41L Customer surveys	,441	,209	,160	,113	,038
41J Internet	,437	,091	,159	,286	,010
42A 'Coffee table' conversations and such	,374	,029	,211	-,194	,328
42B Via e-mail lists, intranet	,342	,259	-,098	,297	-,012
41FProfessinal newspapers	,542	-,359	,545	-,063	-,016

Extraction Method: Principal Axis Factoring.

a. 5 factors extracted. 20 iterations required.

Appendix 8

Rotated Factor Matrix[a]

	Factor				
	1	2	3	4	5
41BAdviced given by other authorities (employment and economic development centers	,800	,205	,089	,138	,141
41A Advices given by municipality level authorities	,750	,056	,218	,066	,101
41CAdvisory services (ProAgria and such)	,710	,263	,123	,209	,012
41N Income statements and balance sheets	,157	,733	,268	,106	,154
41M Quality handbooks and such	,121	,613	,068	,306	,140
41O Tax information	,225	,601	,274	,139	,074
42E Quality handbooks	,185	,490	-,030	,283	,245
41FProfessinal newspapers	,164	,086	,822	,119	,015
41EProfessional books (reports, guide books)	,130	,136	,645	,140	,103
41G Personal contacts to other entrepreneurs	,125	,164	,470	,221	,214
41KTelevision, radio	,150	,143	,123	,496	,073
42B Via e-mail lists, intranet	,052	,138	-,073	,481	,153
41J Internet	,060	,071	,241	,472	,131
41ICommon seminars and lectures to entrepreneurs	,185	,183	,344	,462	-,079
41H personal contacts to advisers	,342	,182	,244	,452	-,023
41L Customer surveys	-,013	,195	,221	,364	,241
42C Other internal information (notes on board, oral advices)	,101	,228	,063	,282	,729
42A 'Coffee table' conversations and such	,091	,097	,348	-,014	,437
42D Internal meetings, training courses	,110	,380	,051	,369	,432

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

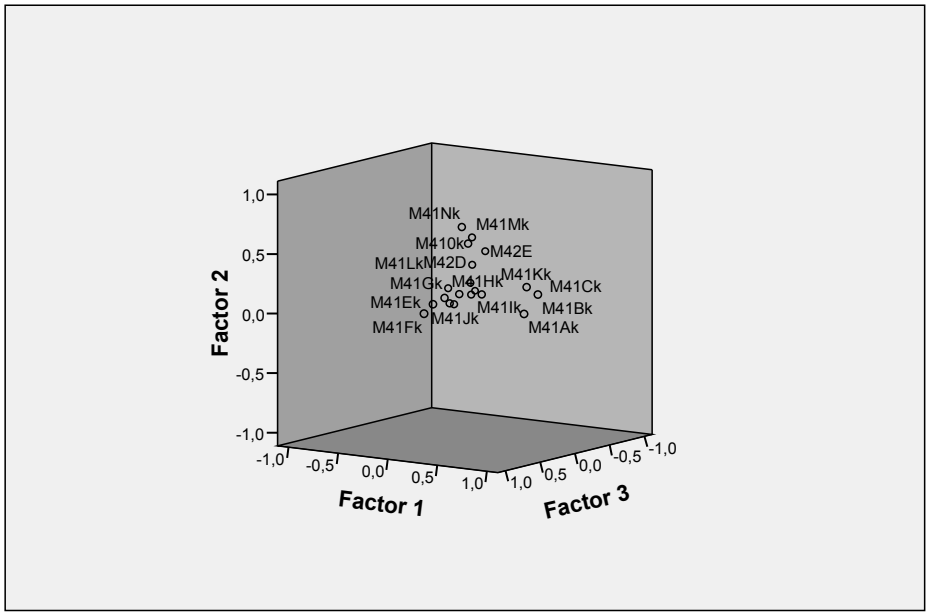
Appendix 8

Factor Transformation Matrix

Factor	1	2	3	4	5
1	,464	,518	,437	,479	,311
2	-,645	,370	-,398	,300	,445
3	-,577	-,190	,794	,030	,013
4	,022	-,535	-,139	,810	-,194
5	,189	-,522	,005	-,154	,817

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.

Factor Plot in Rotated Factor Space



Appendix 9

Appendix 9. Discriminant analysis for 2001 data

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		597	90,0
Excluded	Missing or out-of-range group codes	0	,0
	At least one missing discriminating variable	0	,0
	Both missing or out-of-range group codes and at least one missing discriminating variable	66	10,0
	Total	66	10,0
Total		663	100,0

Group Statistics

overdiversfication01		Mean	Std. Deviation	Valid N (listwise)	
				Unweighted	Weighted
no problems	we have enough labour for farming and other business	4,60	,491	240	240,000
	we have enough capital for farming and other business	4,47	,500	240	240,000
labour problem	we have enough labour for farming and other business	1,99	,607	153	153,000
	we have enough capital for farming and other business	3,91	,682	153	153,000
capital problem	we have enough labour for farming and other business	4,39	,490	95	95,000
	we have enough capital for farming and other business	2,29	,682	95	95,000
capital and labour constrains	we have enough labour for farming and other business	1,83	,506	109	109,000
	we have enough capital for farming and other business	1,64	,482	109	109,000
Total	we have enough labour for farming and other business	3,39	1,406	597	597,000
	we have enough capital for farming and other business	3,46	1,271	597	597,000

Appendix 9

Analysis 1

Box's Test of Equality of Covariance Matrices

Log Determinants

overdiversfication01	Rank	Log Determinant
no problems	2	-2,989
labour problem	2	-1,809
capital problem	2	-2,195
capital and labour constrains	2	-2,862
Pooled within-groups	2	-2,387

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

Test Results

Box's M		89,565
F	Approx.	9,882
	df1	9
	df2	1305827,181
	Sig.	,000

Tests null hypothesis of equal population covariance matrices.

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	6,920[a]	71,5	71,5	,935
2	2,761[a]	28,5	100,0	,857

a. First 2 canonical discriminant functions were used in the analysis.

Appendix 9

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	6,920[a]	71,5	71,5	,935
2	2,761[a]	28,5	100,0	,857

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	,034	2012,735	6	,000
2	,266	785,581	2	,000

Standardized Canonical Discriminant Function Coefficients

	Function	
	1	2
we have enough labour for farming and other business	,866	-,509
we have enough capital for farming and other business	,421	,912

Structure Matrix

	Function	
	1	2
we have enough labour for farming and other business	,908*	-,419
we have enough capital for farming and other business	,507	,862*

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

*. Largest absolute correlation between each variable and any discriminant function

Appendix 9

Functions at Group Centroids

overdiversfication01	Function	
	1	2
no problems	2,723	,408
labour problem	-1,988	2,063
capital problem	,798	-2,806
capital and labour constrains	-3,901	-1,349

Unstandardized canonical discriminant functions evaluated at group means

Classification Statistics

Classification Processing Summary

Processed		663
Excluded	Missing or out-of-range group codes	0
	At least one missing discriminating variable	66
Used in Output		597

Prior Probabilities for Groups

overdiversfication01	Prior	Cases Used in Analysis	
		Unweighted	Weighted
no problems	,250	240	240,000
labour problem	,250	153	153,000
capital problem	,250	95	95,000
capital and labour constrains	,250	109	109,000
Total	1,000	597	597,000

Appendix 9

Classification Results[a]

		overdiversfication01	Predicted Group Membership				Total
			no problems	labour problem	capital problem	capital and labour constrains	
Original	Count	no problems	240	0	0	0	240
		labour problem	0	153	0	0	153
		capital problem	0	0	95	0	95
		capital and labour constrains	0	0	0	109	109
	%	no problems	100,0	,0	,0	,0	100,0
		labour problem	,0	100,0	,0	,0	100,0
		capital problem	,0	,0	100,0	,0	100,0
		capital and labour constrains	,0	,0	,0	100,0	100,0

a. 100,0% of original grouped cases correctly classified.

Discriminant analysis for 2006 data

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		370	85,5
Excluded	Missing or out-of-range group codes	0	,0
	At least one missing discriminating variable	0	,0
	Both missing or out-of-range group codes and at least one missing discriminating variable	63	14,5
	Total	63	14,5
Total		433	100,0

Appendix 9

Group Statistics

overdiversification		Mean	Std. Deviation	Valid N (listwise)	
				Unweighted	Weighted
no problems	we have enough labour for farming and other business	4,44	,569	158	158,000
	we have enough capital for farming and other business	4,47	,501	158	158,000
labour problem	we have enough labour for farming and other business	1,87	,589	78	78,000
	we have enough capital for farming and other business	3,92	,717	78	78,000
capital problem	we have enough labour for farming and other business	3,88	,681	81	81,000
	we have enough capital for farming and other business	2,57	,590	81	81,000
capital and labour constrains	we have enough labour for farming and other business	1,75	,585	53	53,000
	we have enough capital for farming and other business	1,62	,489	53	53,000
Total	we have enough labour for farming and other business	3,39	1,324	370	370,000
	we have enough capital for farming and other business	3,53	1,208	370	370,000

Analysis 1

Box's Test of Equality of Covariance Matrices

Log Determinants

overdiversification	Rank	Log Determinant
no problems	2	-2,595
labour problem	2	-1,726
capital problem	2	-1,838
capital and labour constrains	2	-2,517
Pooled within-groups	2	-2,142

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

Appendix 9

Log Determinants

overdiversification	Rank	Log Determinant
no problems	2	-2,595
labour problem	2	-1,726
capital problem	2	-1,838
capital and labour constrains	2	-2,517
Pooled within-groups	2	-2,142

Test Results

Box's M		34,465
F	Approx.	3,785
	df1	9
	df2	419383,694
	Sig.	,000

Tests null hypothesis of equal population covariance matrices.

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	5,252[a]	73,1	73,1	,917
2	1,936[a]	26,9	100,0	,812

a. First 2 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	,054	1065,003	6	,000
2	,341	394,160	2	,000

Appendix 9

Standardized Canonical Discriminant Function Coefficients

	Function	
	1	2
we have enough labour for farming and other business	,725	-,691
we have enough capital for farming and other business	,644	,767

Structure Matrix

	Function	
	1	2
we have enough labour for farming and other business	,766*	-,643
we have enough capital for farming and other business	,690	,724*

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

*. Largest absolute correlation between each variable and any discriminant function

Functions at Group Centroids

overdiversification	Function	
	1	2
no problems	2,321	,060
labour problem	-1,386	2,274
capital problem	-,493	-1,859
capital and labour constrains	-4,125	-,685

Unstandardized canonical discriminant functions evaluated at group means

Appendix 9

Classification Statistics

Classification Processing Summary

Processed		433
Excluded	Missing or out-of-range group codes	0
	At least one missing discriminating variable	63
Used in Output		370

Prior Probabilities for Groups

overdiversification	Prior	Cases Used in Analysis	
		Unweighted	Weighted
no problems	,250	158	158,000
labour problem	,250	78	78,000
capital problem	,250	81	81,000
capital and labour constrains	,250	53	53,000
Total	1,000	370	370,000

Classification Results[a]

		Predicted Group Membership				
	overdiversification	no problems	labour problem	capital problem	capital and labour constrains	Total
Original Count	no problems	152	6	0	0	158
	labour problem	0	78	0	0	78
	capital problem	0	0	81	0	81
	capital and labour constrains	0	0	0	53	53
%	no problems	96,2	3,8	,0	,0	100,0
	labour problem	,0	100,0	,0	,0	100,0
	capital problem	,0	,0	100,0	,0	100,0
	capital and labour constrains	,0	,0	,0	100,0	100,0

a. 98,4% of original grouped cases correctly classified.